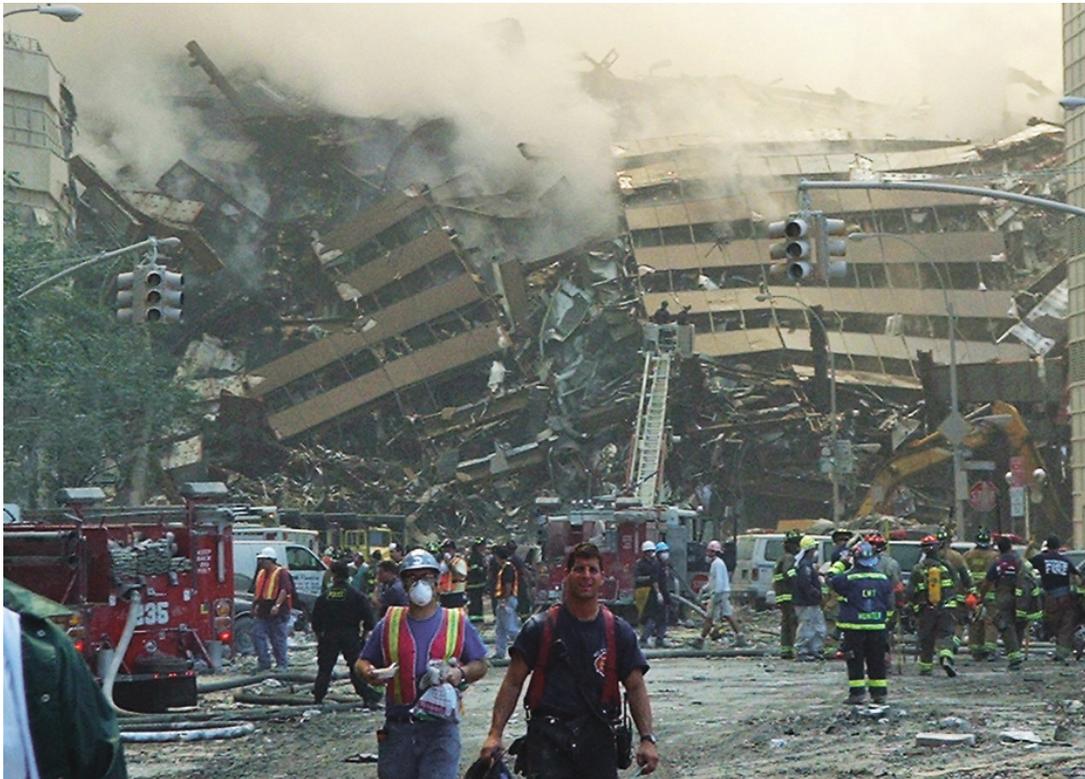


Sudden Building Collapse

An Evaluation of a New Risk in Operational Fire-fighting

An Independent Analysis



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Hyperlinks provide direct access to referenced sources and reports when this report is accessed online.

Aim

The aim of this study was to assess the validity of a hitherto unknown risk in the realm of operational fire-fighting. A risk revealed as a result of a \$50 million government investigation into a building collapse in 2001, which identified that normal office fires, involving ordinary office combustibles at ordinary combustible load levels, can potentially cause a fire-protected steel-framed building to suddenly and completely collapse during an operational fire-fighting incident.

In order to reach a responsible and reliable understanding of the true level of risk, this evaluation has attempted to honestly and objectively follow all of the evidence and the data, wherever it might lead, without prejudice. The details and evidence from within the original government reports, independent expert reports regarding the collapse and its circumstances, as well as the experiences and evidence of witnesses and emergency personnel present at the incident, have all been included and evaluated.

The Origin of the Identified Risk

The risk to Firefighters from sudden building collapse was highlighted in the United States of America's National Institute of Standards and Technology (NIST) reports into the collapse of World Trade Center Building 7:

[“Federal Building and Fire Safety Investigation of the World Trade Center Disaster, Structural Fire Response and Probable Collapse Sequence of World Trade Center Building 7”](#), and [“Final Report on the Collapse of World Trade Center Building 7”](#).

For a full and in-depth understanding of this risk as identified by the collapse of World Trade Center Building 7 the reader is advised to access and read the above documents.

The following is the Executive Summary of the NIST 'Final Report on the Collapse of World Trade Center Building 7', section ES.1.:

WORLD TRADE CENTER BUILDING 7 (WTC7)

WTC 7 was a 47 story office building located immediately to the north of the main WTC Complex. It had been built on top of an existing Consolidated Edison of New York electric power substation, which was located on land owned by The Port Authority of New York and New Jersey. On September 11, 2001, WTC 7 endured fires for almost seven hours, from the time of the collapse of the north WTC tower (WTC 1) at 10:28:22 a.m. until 5:20:52 p.m., when it collapsed. This was the first known instance of the total collapse of a tall building primarily due to fires.

WTC 7 was unlike the WTC towers in many respects. It was a more typical tall building in the design of its structural system. It was not struck by an airplane. The fires in WTC 7 were quite different from those in the towers. Since WTC 7 was not doused with thousands of gallons of jet fuel, large areas of any floor were not ignited simultaneously. Instead, the fires in WTC 7 were similar to those that have occurred in several tall buildings where the automatic sprinklers did not function or were not present. These other buildings did not collapse, while WTC 7 succumbed to its fires. - (NIST, NCSTAR 1A, WTC Investigation, xxxv.)

In view of the unprecedented nature of this building's collapse, “primarily due to fires”, one might expect that it is an anomalous occurrence with no realistic probability of being repeated. However, NIST does not hold that view and therefore make the following recommendations to avoid its reoccurrence:

Summary of NIST recommendations

The report concludes with a list of 13 recommendations for action in the areas of increased structural integrity, enhanced fire endurance of structures, new methods for fire resistant design of structures, enhanced active fire protection, improved emergency response, improved procedures and practices, and education and training. (NIST, NCSTAR 1A, WTC Investigation, xv.)

In the interests of making the above information easily available to the time restricted reader, please see the following summary of information related to this risk detailed in the above reports.

A summary of identified risks to Operational Firefighters:

- A normal office fire, involving ordinary office combustibles at ordinary combustible load levels, caused a steel-framed fire-protected building to suddenly and completely collapse.
- The collapse was not attributed to design or construction faults, damaged fire protection or significant structural damage. “Even without the structural damage, WTC 7 would have collapsed from the fires that the debris initiated.”-NIST
- The collapse was not due to aircraft impact, explosives, bombs or missiles.
- The existence of prolonged static fires from stored fuels was eliminated as a possible cause.
- “This was the first known instance of the total collapse of a tall building primarily due to fires” – Executive Summary - WTC7 Final Report, NIST (2008).
- Building height was not a dominant causal factor.
- The building employed the same design and construction as buildings of its type in the UK and worldwide.
- NIST made many recommendations for building design code changes, upgrades to fire protection and emergency procedures, thus indicating their view of a possible reoccurrence.

UK Fire Service Considerations

- Current UK Fire Service procedures rely on two main assumptions:
 - Normal office fires cannot cause the complete collapse of a steel framed building.
 - Any steel framed building will demonstrate signs of failure for a considerable period of time prior to any form of collapse. Signs would include sagging of steel beams and columns.

The NIST report of this collapse identifies these assumptions to be FALSE and DANGEROUS. If correct, an unrecognised risk has been identified and must be addressed in legal compliance with the [Management of Health and Safety at Work Regulations 1999](#)

(This linked [PowerPoint presentation](#) covers these points as per the NIST report.

Must be opened with PowerPoint software to completely view all media)

Introduction

Let's first define why this is so important. In historical terms, this is probably the most important building collapse ever to have occurred; not just from an architectural perspective, not only because it raises very significant questions about the safety of high-rise occupiers and their rescuers should a similar building be involved in fire but because of what it represents in terms of what happened as a result of its collapse. However, the primary purpose of this assessment is to establish what level of risk the report of this collapse identifies for operational Firefighters.



The official investigation and final report of this incident were published seven years after the event in November 2008 by the National Institute of Standards and Technology (NIST), an agency of the US Department of Commerce.

The Salomon Brothers' Building, also known as World Trade Centre Building 7 (WTC7), was a 610 feet tall, 47 storey modern steel-framed high-rise building built in 1987. It was a class-A fully fire protected structure with reinforced concrete floors.

At 5:21 pm on September 11th, 2001, the entire building suddenly and completely collapsed in just under 7 seconds. The cause of the collapse has been reported to be due to office fires, involving ordinary office combustibles at ordinary combustible load levels.

From a firefighting perspective, for a number of reasons, some of the most dangerous fires occur in high-rise buildings. Fire Service operational procedures for fire-fighting in high-rise buildings, therefore, aim to maximise the effectiveness of firefighting and rescue operations in these situations whilst minimising the risks taken in doing so.

These procedures, depending upon dynamic risk assessments, will normally recommend the deployment of Firefighters into high-rise fires via a protected stairwell if possible. Progress is then made upwards towards the floor affected by the fire. A forward control point called a 'Bridgehead' is set up two floors below the fire so that operations can be controlled from an advanced point. Firefighters are committed into the main risk area from this point, sometimes deep in the building, to tackle the fires and potentially rescue casualties. They will also progress above the fire to what is called the 'Search Sector' to rescue casualties. These procedures are based upon accepted assumptions of architectural capability to tolerate and withstand the effects of fire without failing.

These assumptions are based not only upon experience but the understanding that architects and engineers design these buildings with fire risk as an integral part of their specifications. This is one of the reasons why Firefighters raced into the twin towers on the 11th September 2001 without expecting the unprecedented and horrific circumstances which followed. They knew there was danger but not from complete building collapses.

In recent history, there have been many very well publicised high-rise and skyscraper fires where fires have been very advanced and aggressive and, in accordance with what the building designers intended, the buildings withstood the effects of the fires and remained intact. From an empirical perspective, there is no historical evidence to indicate a cause for concern in this regard. Up until this incident, a steel-framed high-rise building has never in the history of modern architecture collapsed due to fire. For this reason, the circumstances of this incident require a serious and critical review from an operational fire-fighting perspective in order to establish what degree of new risk has been identified.

Summary of Findings

The following is a condensed compilation of the main findings of this independent critical analysis.

- The building was modern, in good condition, steel-framed with reinforced concrete floors, with high-specification class-A fire protection (2-3 hours' fire-protection-rated and easily able to tolerate normal fires).
- Extensive damage was caused to the south face from falling debris, but the NIST report states that this was not a contributing factor in causing the building's collapse. Engineers have demonstrated that if this damage were to be considered a major factor the building would have fallen asymmetrically, toppling in the direction of that damage.
- There is suspicion about what ignited the fires and when they started. NIST reports falling debris as a "likely" cause from the north tower collapsing at 10:28am, however, there were witness reports of "thick smoke" and an explosion from within Building 7 at about 9:30am which contradicts this claim.
- The fires were normal in size, the sort of fires to be expected in any normal office type environment. There was nothing extraordinary about their fuel source or location that might explain a prevention of effective fire-fighting operations.
- The building's fire alarm was linked to the automatic sprinkler system. The fire alarm had been deactivated due to being set in test mode for 8 hours that day, starting at 6:47am, it failed to reactivate at 2:47pm.
- The sprinklers did not activate. The official report claims that the sprinklers did not activate due to a broken water main. There is strong evidence to support good mains water supplies, which could have been supplemented and boosted by a manually operated sprinkler system pump in the building.
- The sprinkler system could also have been charged by FDNY from external siamese fittings outside the building. This did not happen.
- Firefighting operations were prematurely curtailed in Building 7. Firefighters were withdrawn from the building early in the day based upon the orders of an unknown city official who predicted the unprecedented fire-induced collapse of this building 5 hours in advance.
- The official reasons provided for the Firefighters' withdrawal included an alleged lack of water and resources. Water was available in ample volume via the city water mains, and from 3 fire boats located nearby on the river Hudson, each capable of providing up to 18,000 gallons of water per minute. Fire-fighting resources in lower Manhattan were at an all-time high. There were more fire-fighting resources, including, in the face of terrible and unprecedented FDNY loss of life, an army of very willing and eager Firefighters wanting to work.
- The official study and technical theory of the collapse of the building are, according to thousands of architects and engineers, unscientific and false. These same engineers and architects are endorsed by scientists who confirm that the NIST explanation is not only false but impossible.
- Experts have found NIST's theory of collapse to be riddled with faults, omissions, distortions and ignored critical details.
- NIST refuses to release its data for peer-review and has routinely refused to answer difficult questions from experts about inconsistencies and errors in its theory of collapse.

- When the building collapsed there were many witnesses reporting the sounds of loud, fast and repeated explosions. Military grade nano thermite residues were discovered in the dust of the remains of the buildings. This fact has been confirmed via an independent and international rigorous scientific peer review process.
- When the building did collapse it fell at a scientifically verified rate of acceleration indistinguishable from free fall. **This is of great significance and importance.** For a large building (100 metres side to side) to collapse with a level roof line, the building's entire structural integrity must have been removed simultaneously and almost instantaneously.
- In NIST's August 2008 Draft Report the building's free fall was denied. The lead investigator at NIST had openly dismissed free fall having occurred, correctly stating that this fact would require zero structural integrity in the building.
- Due to the intervention of a high-school physics teacher, in the November 2008 Final Report NIST was forced to admit that free fall occurred, but they understated its significance in the report and totally avoided elaborating upon the aforementioned implications of what it identified.
- There is only one explanation for the nearly instantaneous and simultaneous removal of the building's entire structural integrity which caused its free falling collapse - controlled demolition.
- The collapse of this building exemplified seven features of a textbook description of a controlled implosion:
 1. The collapse started from the bottom.
 2. The onset of the collapse was sudden.
 3. The collapse was total.
 4. The building came straight down.
 5. Its acceleration approximated that of a free-falling object.
 6. Most of its concrete was pulverized into tiny particles, resulting in a huge dust cloud.
 7. The building ended up as a relatively small pile of debris.
- Professional controlled demolition experts agree that Building 7 must have been collapsed by controlled demolition, with the added affirmation that this sort of collapse is not possible due to fire alone.
- Based on the fact that a steel-framed building has never before in history collapsed due to fire, the accurate and certain foreknowledge of the collapse 5 hours before it occurred, based only on alleged noises coming from within the building, is extremely questionable, to say the least. The only feasible explanation for this level of certain foreknowledge, which was shared with many emergency workers in the area without explanation, is that this information was based on action based foreknowledge. Complete building collapse due to fires is unprecedented, those who accurately predicted the collapse 5 hours in advance must have known actions had been taken to cause the collapse to occur when it did.
- Researching NIST's credibility has revealed a very broken scientific reputation. It is an agency of the US Department of Commerce. During the years it was writing its World Trade Centre reports, it was, therefore, an agency of the Bush-Cheney administration. In 2004, the Union of Concerned Scientists published a document charging this administration with "distortion of scientific knowledge for partisan political ends." By the end of the Bush administration, this document had been signed by over 15,000 scientists, including 52 Nobel Laureates and 63 recipients of the National Medal of Science.

The Fires in Building 7

The fires in Building 7 are reported by NIST to have started in the building shortly after the second tower came down at 10:28am. The official report states that falling debris from the second tower's collapse ignited the fires.

The building was not hit by an aircraft. It did incur some damage to its south face from falling debris from the disintegration of the north tower but this is not the reason provided for the eventual collapse of the building many hours later.



According to NIST, the fires were said to be on floors 7-13, excluding floor 10, plus a couple of higher floors.

The debris, which is blamed for starting the fires, fell at 10:28am. However, the starting time of the fires is contradicted by a number of witnesses. Barry Jennings and Michael Hess were trapped in the building that morning and reported thick smoke, a lot of heat, and an explosion sometime close to 9:30am, which is before the second tower collapsed and the falling debris. NIST disregarded these reports. The fire alarm control center also

registered a "fire condition" on its system for Building 7 at 10:00:52am (NIST, NCSTAR 1-9, WTC Investigation, p.69.), but NIST decided this was most likely due to dust from the collapse of the first tower at 9:58am. The first photographic evidence of fires from the outside of Building 7 wasn't until 12:15pm.

By NIST's own accounts, "there was no evidence of floor-to-floor fire spread." (NIST NCSTAR 1-9: 341.) This means that the explained source of ignition, falling debris, managed to ignite fires on ten floors, in an environment consisting of large amounts of suffocating gypsum and concrete powder which was coating all surfaces. This is not entirely impossible, but would best be described as being improbable rather than a probable cause of ignition. Once ignited, these fires managed to spread north through the building against a brisk north-westerly wind. To NIST's credit, they did admit that the idea that the fires were ignited by debris from the North Tower as only being a "likely" cause (NIST NCSTAR 1A: 16.). The two adjacent buildings, Verizon building, and U.S. Post Office did not experience any fire ignition, even though they too incurred significant damage from the falling debris of the North Tower.

Under all the aforementioned circumstances of multiple successful seats of fire igniting and developing against the odds and earlier witness reports of "thick smoke" within the building, a fire investigation officer tasked with establishing the true cause of this fire, would not eliminate arson as a possible cause.

There have been previously misplaced beliefs that the entire south face of Building 7 was on fire, probably due to the amount of smoke that was issuing from that side. It was indeed engulfed in smoke and there is a good reason for that. The wind was travelling predominantly from the north-west. Most of the windows on the north, east, and west faces were intact. The fires inside the building on the previously specified floors were obviously producing smoke. Hot fire gases travel up and into areas of lower air pressure via the most well-ventilated route. In the case of Building 7 the smoke from its fires was traveling up and out through the damaged and open south face into the negative air pressure created by the north-westerly wind. This does not mean that the whole of that face was on fire. As the NIST report confirms, fires were confined to a limited number of floors.

Information from witness testimonies, film footage, and photographs identify that the fires were small in number relative to the overall size of the building and involved only normal office contents. Initially, in the investigation it was suspected that diesel fuel stores for generators might have contributed to the fires, however, NIST's final report states that "fuel oil fires did not play a role in the collapse of WTC 7." (NIST NCSTAR 1A: xxxvi.)

An independent Fire Protection Engineer, Scott Grainger, studied the fires and reported them to be scattered and travelling, as they searched for new fuel when existing areas burned out. In his opinion, the fires would have only had sufficient fuel to remain in any one area for no longer than an hour.

In their description of the fires, NIST states that "WTC 7 endured fires for almost seven hours", "the fires burned for sufficient time to cause significant distortion and/or failure to the building structure" and repeatedly reaffirms that the fires were "long lasting and uncontrolled".

A person reading their report with no understanding of actual fire travel might easily believe that static locations within WTC7 were subjected to 7 hours of stress from uncontrolled fires. However, it is impossible for a fire to exist in one location for a period greater than the length of time taken for the fuel in that area to burn away. As NIST rightly points out, the fuel for the fires was ordinary office combustibles at ordinary combustible load levels, there was no use of accelerants, and the spread of fire from combustible to combustible was governed by ordinary fire physics.

On a number of occasions within the official report, the described fires do not match with the photographic evidence. For example, the fires on the 12th floor are observed photographically to have extinguished by 3:40pm yet are reported by NIST in their fire simulation graphics to be highly active between 4:00 pm and 5:00 pm.

Normal office fires, under the circumstances reported at WTC7, would have moved organically, following normal fire spread patterns from the exhausted fuel source to fresh fuel sources where possible, therefore staying fully developed in one area for only approximately 30 to 40 minutes at most. NIST openly admit this fact themselves, in fact, they are less generous and cite fires only being able to persist for between 15-30 minutes ([Ref1](#) and [Ref2](#)). As documentation indicates, WTC7 had 3-hour fire resistance ratings for the columns and 2-hour fire resistance ratings for the floor assemblies (FEMA 2002).

In agreement with historical evidence of much more aggressive and prolonged fires in similar buildings, the reported and observed extent of the fire at this incident should not have compromised the structural integrity of Building 7, and certainly not to such an extent that the building's complete failure would be realistically anticipated.

However, NIST is very confident that fire, and fire alone, was the cause of the building's failure. "Even without the structural damage, WTC7 would have collapsed from the fires that the debris initiated."-NIST

NIST's explanation for WTC7's unique collapse due to fire is blamed primarily upon poor water supply for the sprinkler system and fire-fighting operations. When comparing WTC7 with other similar structures involved in fires it states, "While the fires in the other buildings were actively fought by firefighters to the extent possible, in WTC 7, no efforts were made to fight the fires because of the lack of a water supply."

In the next section, this claim of lack of water supplies shall be explored.

Water Supplies and Fire-fighting

According to NIST the collapse of Building 7 was said to be due to uncontrolled office fires due to a lack of water supplies and fire-fighting resources. In their Executive Summary they state, “The collapse of WTC7 could not have been prevented without controlling the fires before most of the combustible buildings contents were consumed.”

NIST’s lead investigator stated that the fires were able to burn out of control for the following reason, “The city water main had been cut by the collapse of the two towers, so the sprinklers in Building 7 did not function for much of the bottom half of the building.” This lack of water was said to have been crucial:

Had a water supply for the automatic sprinkler system been available and had the sprinkler system operated as designed, it is likely that fires in WTC 7 would have been controlled and the collapse prevented. (NIST NCSTAR 1A:xxxvi.)(Emphasis added)

However, there are contradicting reports showing good water availability for both firefighting and the sprinkler system from the municipal water supply and FDNY fire boats.

The municipal water system in Manhattan is supplied by a series of reservoirs located in upstate New York. Water is gravity fed via large underground aqueducts. Water pressure for lower Manhattan south of 14th Street is regulated before entering a network of 20-inch primary mains and 12-inch diameter secondary mains in each street. Water flows through the piping grid along multiple north-south primary mains to supply lower Manhattan.

There are 20-inch primary mains in West Street, Greenwich, West Broadway, Church Street and Broadway bringing water south toward the World Trade Center. Additional water mains east of Broadway also contribute to the delivery capacity to lower Manhattan. 20-inch east and west mains on principal east-west streets such as Chambers, Vesey and Liberty interconnect with the north-south mains to create the primary distribution grid. Smaller diameter mains (12-inch) connect to the 20-inch primary mains, to provide water supplies to individual buildings.

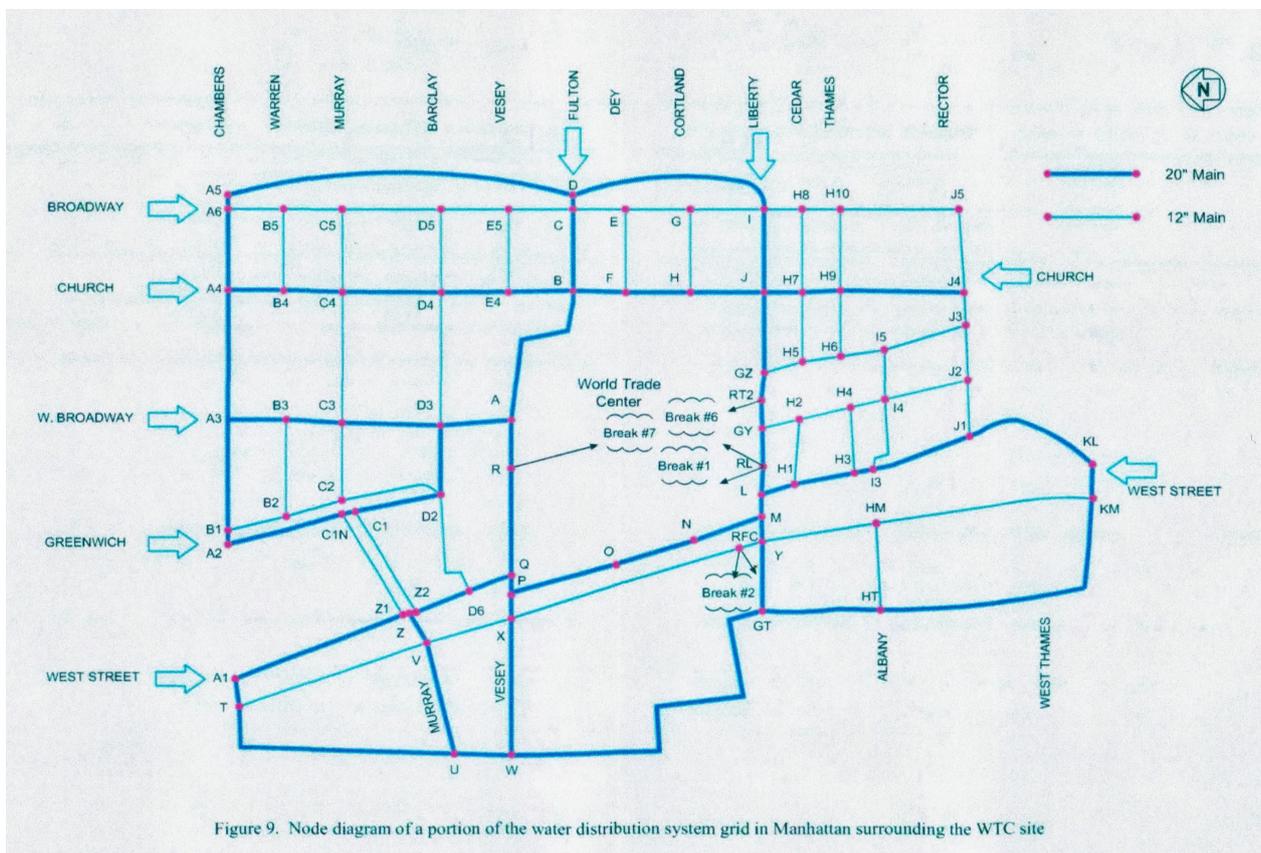
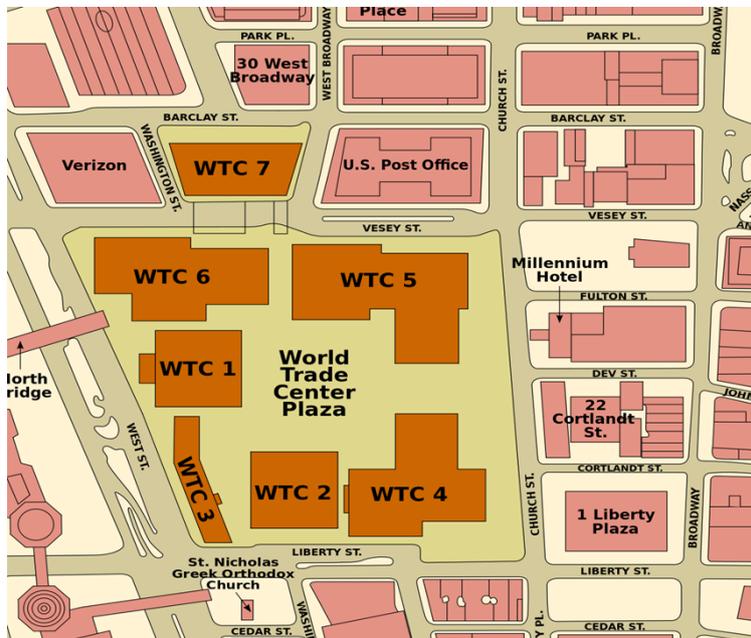


Figure 9. Node diagram of a portion of the water distribution system grid in Manhattan surrounding the WTC site



The combination of 20-inch primary and 12-inch secondary mains connected to a gravity fed supply with enormous volume capacity represents a very robust water distribution system.

Permanent water-metering equipment and control valves enable water pressure regulation. The New York City Department of Environmental Protection is responsible for regulating the pressure throughout the water supply system. Multiple pressure regulators reduce the pressure from the incoming gravity-fed aqueducts to maintain a constant pressure on the mains serving lower Manhattan.

The table below shows the average pressure recorded at the 14th Street regulators between 6:40am and 11:50am on September 11, 2001.

Table 1. Average water pressures, 14th Street pressure regulators, 9/11/01

Aqueduct – 14 th Street	Regulator Identification	Average Steady State Pressure 6:40 am to 11:50 am, 9/11/01
Tunnel No. 1, Shaft 18	SE Regulator: #1 Pressure	51 psi
Tunnel No. 1, Shaft 18	SW Regulator: #2 Pressure	44 psi
Tunnel No. 1, Shaft 18	NW Regulator: #3 Pressure	50 psi
Tunnel No. 1, Shaft 19	Regulator	49 psi
Tunnel No. 1, Shaft 20	SE Regulator	50 psi
Tunnel No. 1, Shaft 20	NE Regulator	53 psi
Tunnel No. 1, Shaft 20	NW Regulator	50 psi
Tunnel No. 1, Shaft 21	Tunnel No. 1, Shaft 21, Channel 3	60 psi

As can be seen in the average steady-state pressure results recorded above, **“The collapse of the towers did not have any effect on pressures at 14th Street regulators.”** The large diameter aqueducts from upstate New York which terminate at the pressure regulation system on 14th Street were taken as a point of constant pressure serving the mains to the south at the World Trade Center. **Hydraulic calculations clearly show that even with the increase in flow due to the broken street mains, the robust municipal water distribution system of Manhattan had the capacity to deliver even more water than was consumed.** ([Full Fire Science & Engineering report](#)).

The breaks that were identified to the city water mains, were found during the clean-up and repair operations. A number of these breaks did not occur during the incident and would not have affected WTC7. **It is reported that the breaks which occurred to the north of the twin towers have been attributed to either the collapse of Building 7 or to the movement of heavy equipment after the incident, and therefore would not have had a detrimental effect on WTC7's water supply and fire-fighting operations.** (Ref) Debris around WTC7, including surrounding streets, was documented as being "light" in the 2002 FEMA report (see figure 1-7).

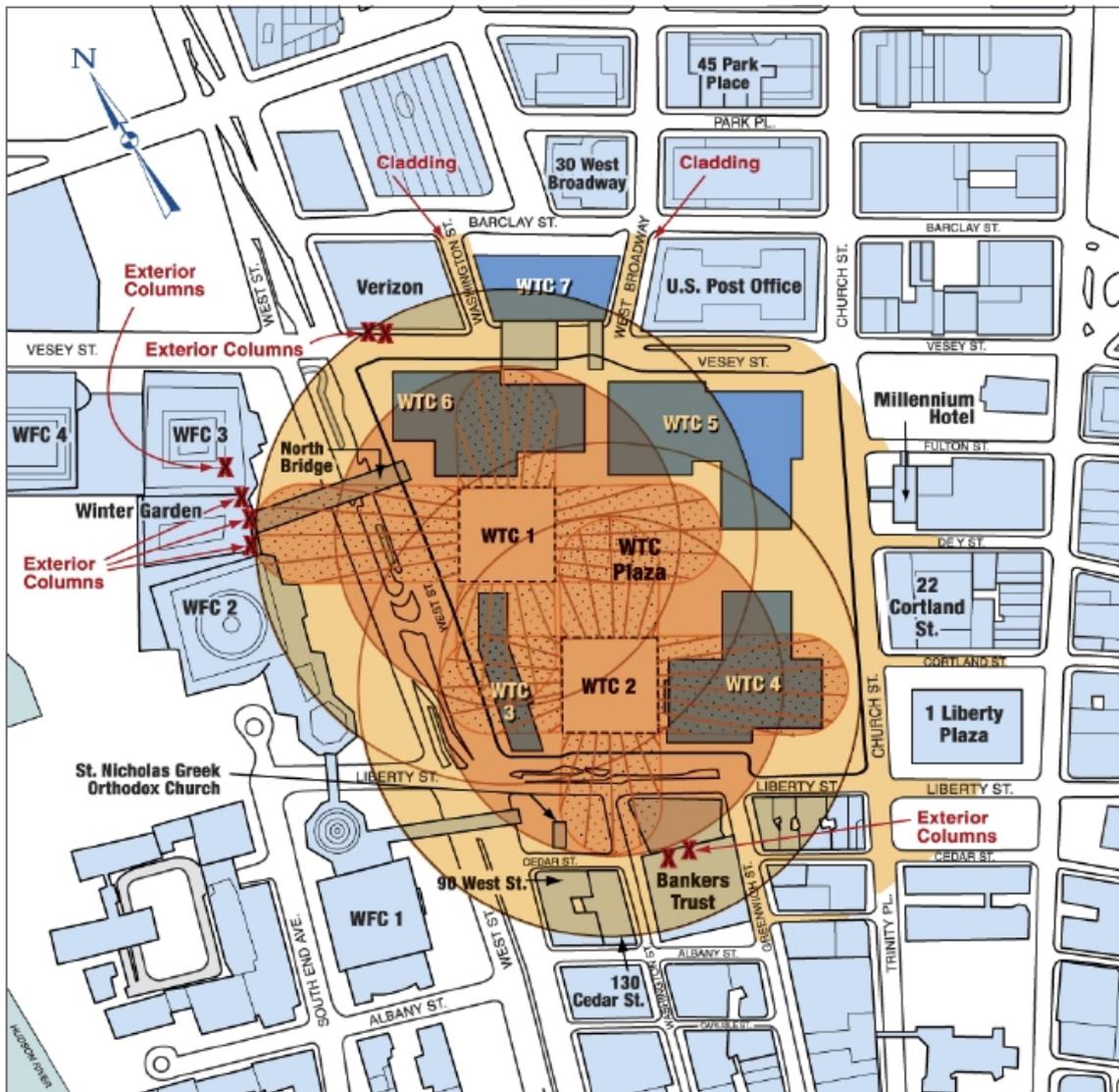


Figure 1-7 Schematic depiction of areas of collapse debris impact, based on aerial photographs and documented damage. Striped areas indicate predominant locations of exterior steel columns. Inner circles indicate approximate radius of exterior steel columns and other heavy debris. Outer circles indicate approximate radius of aluminum cladding and other lighter debris. Heavy Xs show where exterior steel columns were found outside the predominate debris areas.

In spite of the reported fractures at other locations the pressure along Vesey Street outside WTC7 was maintained above a minimum of 22 psi. Hydrants in the vicinity of WTC7 are quoted as having water pressure “sufficient to supply FDNY engines, such that they had the capacity to pressurize interior standpipe and sprinkler piping to support manual firefighting.” (WTCI-33-S report preview) and (Full Fire Science & Engineering report).

Table 3. Summary of hydraulic conditions in municipal water mains surrounding WTC site after collapse of WTC 1

North - South Street	East - West Street	Node Reference	Importance	Pressure (psi)	Flow (gpm)
Washington	Liberty	GY	Hydrant (potential use)	19.2	
Greenwich	Liberty	GZ	Hydrant (potential use)	21.2	
Church	Liberty	J	Hydrant (potential use)	23.4	
West		BRK3	Break in 20" main, from north	0.1	14,700
		BRK3A	Break in 20" main, from south	0.1	31,850
		BRK4	Break in 20" main from east	0.4	28,550
		BRK4A	Break in 20" main from west	0.7	33,550
		RT2	South feed to 12-inch utility main broken in WTC complex	19.9	
Utility Rack		BRK7	Broken 12-inch main inside WTC complex from Liberty Street	0.5	3,300
Greenwich	Vesey	R	North feed to 12-inch utility main broken in WTC complex	14.0	
Calculated pressure and flow to fire pumps in WTC 2 via broken 12-inch main in utility rack.	Internal main in utility rack	FSP1	Connection to 8" supply to WTC 2 standpipe pump	1.2	
		FSP2	Suction inlet to standpipe pump in WTC 2	0.4	750
	Internal main in utility rack	AS1	Connection to 8" supply to WTC 1 sprinkler pump	1.5	
		AS2	Suction inlet to sprinkler pump in WTC 1	0.0	1,000
	Internal main in utility rack	BRK8	Discharge from ruptured 12" main near WTC 1	0.5	4,200
Church	Vesey	E4	Hydrant (potential use)	23.3	
Church	Fulton	B	Hydrant (potential use)	23.1	
Church	Dey	F	Hydrant (potential use)	23.3	
Church	Cortlandt	H	Hydrant (potential use)	23.4	
				TOTAL	117,900

Above Table 3 taken from Hughes Associates Inc. WTCI-33-S - [Full Fire Science & Engineering report](#)

In agreement with the evidence provided above detailing adequate water supplies in the city mains, there are details within the actual NIST report of the city water mains hydrants outside WTC7, and in many other locations in its vicinity, supplying water to operating fire appliances: -

NIST (NCSTAR 1-8 p. 205) :-

9:40 Engine 162 (**post collapse operations WTC 1 and WTC 2, operations at WTC 7, hydrant at Church and Vesey Streets, stretched line to WTC 7**)

9:41 Engine 219 (post collapse operations, **established water supply at West and Liberty Streets**, stretched hose lines and extinguished ground level fires)

9:43:04 Engine 220, (Command post West and Liberty Streets, approaching WTC 2 at collapse, extinguish fire on 9th floor of Gateway Plaza, **assisted with water relay from Marine 1 to Vesey and West streets**) **WTC 6&7**

9:55 Engine 284/207 (post collapse operations, **hose line stretch from Marine 1 to Vesey Street**) **WTC 6&7**

9:55 Engine 246/244 (**post collapse operations 5 WTC, hydrant hookup on Broadway and Church Streets**, water relay to E 503, operated hose line on street level fires at Church and Liberty Streets)“

NIST (NCSTAR 1-8 pg 216):-

10:06 Engine 160 (post collapse operations, **supplied water to Tower Ladders operation on WTC 7**)

10:07:39 10-84 Engine 284, (post collapse operations, **hose line stretch from Marine 1 to Vesey street**) **WTC 6&7**)

10:12: Engine 518 (post collapse operations, **stretched hose lines and operated in WTC 7**)

NIST (NCSTAR 1-8 pg 223):-

10:06:01 10-84, Engine 271/E 6, (left Command Post at West and Vesey Streets when WTC 1 collapsed, **supplied water to standpipe Siamese at Verizon Building, extinguished fires around Verizon bldg.**) [G]

10:15 Engine 236/15 (responding to scene when WTC 1 collapsed, stretched handlines from building standpipes and extinguished street level fires)

10:30:08 Engine 318/279 (post collapse operations, Staging area at West and Chambers Streets, **hose stretch from Marine 1 to Vesey Street**) **WTC 6&7**

10:32:12 10-84 , Engine 328/E 279 (post collapse operations, Staging area at West and Chambers Streets, **hose stretch from Marine 1 to Vesey Street**) **WTC 6&7**

10:32:30 10-84, Engine 247/E240 (**Command Post at Broadway and Vesey Streets, post collapse operations hydrant hookup and supply of hose lines to Tower Ladders**)

NIST (NCSTAR 1-8 pg 228):-

10:30:08 10-84 , Engine 318/E 279 (post collapse operations, Staging area at West and Chambers Streets, **hose stretch from Marine 1 to Vesey Street**) **WTC 6&7**

10:38:32 10-84 , Engine 309 /E33, (reported to Command Post at West and Liberty streets, stretched 3 ½ inch hose lines from command post to Marine Companies at pier, stretched supply lines from Marine 2 to E 209 E 279, stretched supply lines to manifolds and Tower Ladders, searched collapse area)

10:45 Engine 514 (hooked up to hydrant in front of 80 West Street, stretched 3 ½ inch line to Ladder 15 in front of 90 West Street)

11:10:21 10-84, Engine 206 (hooked up to serviceable hydrant at Nassau and John Streets, relayed water to E221 that was supplying a Tower Ladder, stretched and operated hose lines at Liberty Street debris fires)

11:19 Engine 155 (search of 5 WTC, supply hose lines to debris pile of WTC 2, **hooked up to serviceable hydrant at Church and Murray Streets**)

“Marine 1” above is referring to the fire boats being used to provide water. There were three fireboats situated nearby in the Hudson river, each capable of pumping up to 18,000 gallons of water a minute. These were used to provide water to the incidents at the World Trade Centre for over 80 hours.

Building 7’s sprinklers

The building was fitted with a fire standpipe system (called a ‘riser’ in the UK) and sprinkler systems consisting of wet and dry type systems. The wet sprinkler system was a combination fire standpipe and sprinkler system.

The primary water supply to the sprinkler system for floors 1 to 20 was via the city water main, higher floors were supplied by a combination of automatic fire pumps and a gravity fed water supply from large water tanks on the 46th floor.

The WTC7 sprinkler system was connected to two separate building main lines and two separate city water mains. *“Water for the fire standpipe [riser] and sprinkler system is supplied through two separate 8-inch building main lines connected to two separate city mains.”* (Ref). NIST states that the water main supply to the sprinklers was severed, which means both of its supply mains would need to have been broken.

If the mains water pressure being supplied to the building had been too low the system should still have coped. The system was designed to operate with varying city water main pressure situations - “During a fire emergency, automatic fire pump FP-1 will increase the pressure of the city water to provide system operating pressure. Jockey pump JP-1 will maintain required system pressure at all times.” Should these automatic pumps have failed there was a backup pump which could have been operated manually to maintain system water pressure. (Ref)



In the unlikely event that water was limited to the building from both separate mains water supplies being broken, or simply in order to boost the system, the sprinkler system also had the capacity to be charged with water from external Fire Department connections to the building (siamese fittings). These were located on outside walls at Washington St., West Broadway, and the loading dock.

These connections could have been used by the FDNY to provide water to both the risers and the sprinkler system. “During a fire emergency, alternate water supply can be provided [to sprinkler system] by the fire department using fire department connections.” There was, therefore, the capacity to tackle the fire from outside the building using the sprinklers (Ref).

The US “*Firefighting Procedures and Operations for High-Rise Office Buildings*” manual suggests supplying these siamese fittings with at least two pumps at two different siamese connections to ensure adequate water supply was added to the system for extinguishing fires.

The standard pumping fire appliance of the FDNY has a rated pumping capacity of 1000 gpm. “A single standard FDNY fire engine taking suction from one hydrant can supply two hose streams on the 32nd floor with a minimum flow of 250 gpm each.” (NFPA 1901, [Standard for Automotive Fire Apparatus](#)).

NIST claims that their investigations revealed that at around 11:30am there was no water emerging from the hydrant system or in the standpipe system. It was reported that hose lines had been connected to the standpipe/riser system of WTC7 and used to tackle fires in other buildings prior to the collapse of the twin towers. (NIST, NCSTAR 1-9, p.76) This, they say, would have drained the water tanks designed to feed the sprinkler system to the upper floors in WTC7.

The first part of this statement conflicts with this investigation's findings regarding the robust nature of the city water supplies. The obvious question raised by the second part of this statement is, why should Firefighters need to tap into the riser system of a building when it has been shown that there was ample water in the hydrant system, even after the collapses. This makes even less sense because it is said to have occurred before the collapses.

The reason for the sprinkler system's failure to operate on the day remains unanswered. The municipal water supply was capable of supplying the water required. It is unlikely that both separate mains water supplies into the building were broken, especially based on the aforementioned findings that the damaged water mains were to the south of Building 7 prior to its collapse and the clean-up operations. The sprinkler system was connected to the fire alarm system, which had been deactivated, but this *should not* have deactivated the sprinklers. However, deactivating the sprinkler system would be just as simple as deactivating the fire alarm. The turn of a tap or lever and the whole system could easily be taken out of service. This question could have been easily answered via recovery of the relevant mains sprinkler valves from the remains if they hadn't been illegally discarded.

The fire alarm

Building 7's fire alarm was a Firecom 8500 (Syska & Hemessy 1984). The entire alarm system had been put into test mode at 6:47 am on the morning of 9/11 for eight hours, until 2:47 pm. A Freedom of Information Act request for the Emergency Control Centre (ECC) alarm records confirmed this to be true and accurate. (See '[Alarm log](#)' and '[Alarm test conditions](#)'.)

The alarm is only usually placed in test mode by the building manager for occasions when work needs to be done on the system. This ensures that the ECC will ignore any alarm activations. As previously mentioned, the alarm did report a "fire condition" on its system for WTC7 at 10:00:52am, but the FDNY was not notified due to the alarm being in test mode. At 2:47pm, when the alarm test period was meant to automatically revert back to a live system, for some unknown reason the alarm system failed to function and never went back online (NIST, NCSTAR 1-9, p69).

Reactivation of the alarm would have helped Firefighters to locate the exact location of fires for extinguishment. There is no explanation of why the alarm was programmed to go into test mode for 8 hours or why it was not reactivated as soon as the day's events started unfolding. There is evidence of individuals in an official capacity, connected to the building, walking around in the building after the towers collapsed. ([Ref](#)) It's not clear why they were still in the building or why they did not reactivate the alarm system and the sprinklers to help control the fires.

Firefighters at the scene

Retired FDNY Firefighter Rudy Dent, who was at WTC7 during 9/11, states that water supplies were available for operational firefighting. Rudy explains in the following video interview that Firefighters inside WTC7 were requesting additional hand lines (hoses) for tackling the "isolated pockets of fire". They would not request additional lines if the water was in short supply ([Ref](#)).

There is footage available showing a turn-table ladder appliance in firefighting operations near WTC7 tackling a significant building fire with a very healthy water supply through its monitor. ([Ref](#))

Elements within the NIST report contradict their own claims of a lack of water supply. An indirect example: -

“Between 11:00 a.m. and 12:00 noon, approximately 40 FDNY members arrived at WTC 7 with orders to put the fires out inside WTC 7. Inside they surveyed conditions and reported seeing small fires in debris in the core area and on the west side of the same floor of the building. They did not identify the floor where they observed this. A Chief Officer inside the building ran into other firefighters who had searched the upper floors, and they reported that no one was inside the building. When the Chief Officer reached approximately the 9th or 10th floor, he had been inside the building about 20 min to 25 min. He received a radio call from another Chief Officer outside the building ordering him out of WTC 7. The Chief Officer was ordering everyone to leave the building. **The Chief Officer left the building and went to the FDNY Command Post and reported to the Command Post Chief that he believed the fires inside WTC 7 could be extinguished.** Thus, the Chief assigned with firefighting tasks was sent back to extinguish the fires. When he got back to WTC 7, **he met FDNY Superior Officers and an OEM staff member who were also assessing the building’s condition.** At approximately 11:30 a.m., FDNY assigned a different Chief Officer to take charge of operations at WTC 7. He was initially given orders to put the fires out in WTC 7”. - NCSTAR 1-9 Vol.1 pg 299 [pdf pg 343]

The above fire crews would not say they were able to return into WTC7 to extinguish the fires if there was no water supply. Also, note the involvement of an OEM (Office of Emergency Management) staff member in the FDNY operational command decision process. He features later in this report’s section regarding ‘Certain Foreknowledge’.

The following is photographic evidence of water availability. This is an image at 1:30pm with the south face of WTC7 in the background.



Figure 5–48. Frame taken from a video recorded shortly after 1:30 p.m., showing a partial view of the south face of WTC 7.

In the following picture, WTC7 can be seen in the background to the right. The fire appliance is parked at the corner of Barclay and Washington Street; the time is shortly after 10:30am. It appears to have a fat hose delivering water to the pump. The Firefighters are operating the appliance and maneuvering a hose in the background in the vicinity of a small fire. This too suggests a healthy water supply.



In the next shot, firefighting operations can be seen outside Building 7 soon after the collapses of the towers.



The picture below shows an appliance parked in front of the east entrance to WTC7. A pressurised hose resting on top of the car. However, this does not necessarily mean a good water supply. The delivery branch is closed, but so too could the delivery outlet be closed, thus trapping water at pressure in the hose and giving the appearance of a good water supply. But based upon all the other evidence of ample water pressure it's probably also worth recognition.



Yet with all of the above in mind NIST reported that the following occurred - "At approximately 1:15 p.m. to 1:30 p.m., the FDNY Chief Officer in charge of operations at WTC 7 recommended to his Commanding Officer that they should give up on efforts to save WTC 7." This is 4 hours before the collapse.

Reasons for his recommendations were based upon "There was no water immediately available for fighting the fires. They didn't have equipment, hose, standpipe kits, tools, and enough handie talkies for conducting operations inside the building. The reports that WTC 7 was making loud noises as it burned indicated to them that it might be unstable." - NIST (NCSTAR 1-9, WTC Investigation, Chapter 6).

Puzzlement about the failure to fight the fires in WTC7 was reported by Deputy Chief Nick Visconti, who said: "Now, World Trade Centre 7 was burning and I was thinking to myself, how come they're not trying to put this fire out?" Then, after he started implementing Chief Fellini's order to "get these people out of... 7 World Trade Centre," he encountered resistance from some other chiefs, one of whom said: "Oh, that building is never coming down, that didn't get hit by a plane, why isn't somebody in there putting the fire out?" (Firehouse Magazine, 2002)

Similarly, Fire Commissioner Thomas Von Essen reported that, while walking past hundreds of Firefighters who were being held away from WTC7, he heard comments such as, "Why don't they let us in there?". (Thomas von Essen, Strong of Heart: Life and Death in the Fire Department of New York, p.45) There was no shortage of willing Firefighters ready for deployment. There is even reference made to this fact in the NIST report, at "10:29:53

Battalion Chief 37 reports that eight busloads of firefighters are located at the Manhattan Bridge.” (NCSTAR 1-8 p. 232 (2005))

It was reported that the firefighters were kept from fighting the fires in WTC 7 with the claim that the building was going to collapse. This is something that was somehow known many hours in advance. This directive came from mayor Rudy Giuliani’s office of emergency management, based upon the recommendation of the mayor’s engineer who reported noises from inside.

When buildings are on fire there is noise and plenty of it. Noise emanates from the fire itself, especially when inside the building. Stuff breaks and falls, including internal fittings. Pressurized containers vent off gases or explode. There is also sometimes the sound of creaking as the structure expands slightly with the heat, but this is normal and has never before led to the complete collapse of a steel-framed high-rise building, even in much more developed fires. It is, therefore, curious how this engineer, who incidentally has never since been traced, managed to reach this extremely early and unprecedented conclusion.

Based upon the evidence detailed above of actual water supply, both from the city water mains and the fire boats, one has to question NIST’s claims that there was no water for both fire-fighting operations and the sprinkler system.

There is no reasonable explanation to contradict the fact that, had the Firefighters had been allowed to tackle the fires with the water and resources available to them, without interference from city officials, WTC7’s fires would have been easily and safely extinguished by FDNY, probably significantly before 5:20 pm.

The offices in WTC7 were large open plan spaces, therefore by virtue of the improved natural ventilation of fire gases and reduction in heat accumulation created by the damage to the south face, in combination with the north-westerly wind, fire-fighting conditions would have been favorable.

There was probably more Firefighters and equipment in Lower Manhattan on this day than there has ever been in one place in the history of fire-fighting, so to claim a lack of resources and water, as a reason for withdrawal from WTC7 is clearly questionable.

A Scientific Risk Analysis

'Occam's Razor' is a scientific principle, a principle of economy. It encourages one to avoid over-complicating an investigation, to keep it simple and logical by first looking for a simple answer to a problem based upon accepted and tested laws of nature and science. In other words, a simple hypothesis is generally better than a complex one.

"We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances. Therefore, to the same natural effects, we must, as far as possible, assign the same causes." - Sir Isaac Newton.

When we ignore the questions raised about some of the suspicious circumstances and reported anomalies of the fires in Building 7, we are left with the fact that, relatively speaking, the fires were nothing extraordinary. We also have historical evidence of more than 100 previous examples of high-rise fires; most of them very hot, very large and very long-lasting; where not one collapsed.

There is also the scientific principle of research which says – "*Scientists should not affirm an unprecedented cause for a familiar occurrence without good reasons*". So why did NIST, ignoring the scientifically accepted principle of Occam's Razor, begin their investigation with such a complex and unprecedented hypothesis involving fire:

The challenge was to determine if a fire-induced floor system failure could occur in WTC7 under an ordinary building contents fire. (NCSTAR 1-9330.)

When observing the most obvious and prominent occurrences at the scene of the incident openly and honestly, there were many indications of a more well-known and recognised cause of building collapse which would provide a more probable and testable theory. It's an alternative hypothesis based upon Occam's razor. It does not fit into the whole story of what we are being told about the entire day's events, but to exclude it, in disagreement with honest scientific processes, would be prejudiced and require the ignorance of a large amount of the evidence.

It cannot be denied that the collapse of this building exemplified seven features of a textbook description of a controlled implosion:

1. The collapse started from the bottom.
2. The onset of the collapse was sudden.
3. The collapse was total.
4. The building came straight down.
5. Its acceleration approximated that of a free-falling object.
6. Most of its concrete was pulverized into tiny particles, resulting in a huge dust cloud.
7. The building ended up as a relatively small pile of debris.

All of the above features occurred when Building 7 collapsed and are clearly observable with the human eye when watching the videos of the event and looking at photographs of the scene. If online, this 30-second reel captures the collapse. (<https://youtu.be/Mamvq7LWqRU>)

Building 7's collapse started from the bottom, the onset of collapse was sudden, the collapse was complete, it came straight down symmetrically into its own footprint, most of its remains were pulverised into small particles and dust, and its descent was measured scientifically as being indistinguishable from free fall acceleration. These are all very important points but the building's free fall is the most significant point of them all because of what it proves.

According to Architect Richard Gage (AIA), "Buildings which fall due to structural damage fall through the path of least resistance, in the direction of the greatest weakness. They do not collapse down through themselves, which is the path of greatest resistance unless 'something' removes all that resistance." Therefore, in this building 100% of its designed steel-framed structural strength and integrity must have been removed by 'something', allowing it to fall freely and disintegrate uniformly, straight down, with no lateral digression.

A professional expert in controlled demolition from Holland named Danny Jowenko, after being shown the footage of WTC 7 collapsing stated without hesitation "This is a controlled demolition carried out by a team of experts." At the time Jowenko did not know that he was watching footage from September 11th, 2001 and responded in disbelief when the reporters explained what the footage was. ([Ref](#))

In 2007, Jowenko was asked whether he stood by his earlier statement that it must have been a controlled demolition. He replied: "Absolutely.... I looked at the drawings, the construction and it couldn't be done by fire... absolutely not."

Jowenko is corroborated by an independent fellow demolition expert, Tom Sullivan of Controlled Demolition Inc., who states, "There is no possible way those buildings could have collapsed the way they did from the fire."

Hugo Bachmann, Professor emeritus for structural analysis and construction at the Swiss Federal Institute of Technology, stated, "In my opinion WTC7 was with the utmost probability brought down by controlled demolition done by experts."

An acquired expertise in controlled demolition was not needed by many TV reporters commenting during the live coverage of the day, who rightly described what they saw as Building 7 collapsed as being "reminiscent of a controlled demolition."

This is one aspect of the collapse of Building 7 which even NIST has been unable to disguise with its scientific chicanery. NIST has tried, but the evidence is in plain view. [There is extensive video coverage of the building's collapse freely available on the internet](#) . Any person with a basic understanding of physics and the natural laws of motion is able to see the incontrovertible evidence of the cause of this collapse staring straight at them.

A steel-framed building damaged by fire would not completely collapse, and if it did, it absolutely could not come down at a rate even close to that of a building that has been deliberately imploded. Building 7 had eighty-two very substantial steel columns. Office fires simply could not remove all these columns.

The significance of Building 7's collapse in free fall

Regarding matters of such importance, proof is always more valuable than opinion. Thanks to Sir Isaac Newton, gravity is not an opinion or an idea, it's a law.

Unfortunately for NIST, it was outsmarted by a high-school physics teacher named David Chandler. He proved to NIST that when Building 7 collapsed it fell for at least 105 feet, 8 stories, in 2.25 seconds.

His analysis, using simple software, proved that the building fell at a rate indistinguishable from free fall:

Acceleration due to gravity in a vacuum is **9.806** m/s².

Acceleration due to gravity geographically adjusted for New York City it is **9.802** m/s².

Acceleration of Building 7's descent was **9.885** m/s².

David Chandler's question to NIST at a technical briefing:

"Any number of competent measurements using a variety of methods indicate the northwest corner of WTC7 fell with an acceleration within a few percent of the acceleration of gravity. Yet your report contradicts this, claiming 40 percent slower than free fall.... How can such a publicly visible, easily measurable quantity be set aside?"

NIST even tried to deny this, admitting that this would mean there was no structural integrity to the building, but they had been well and truly backed into a corner and were forced to concede on this point eventually.

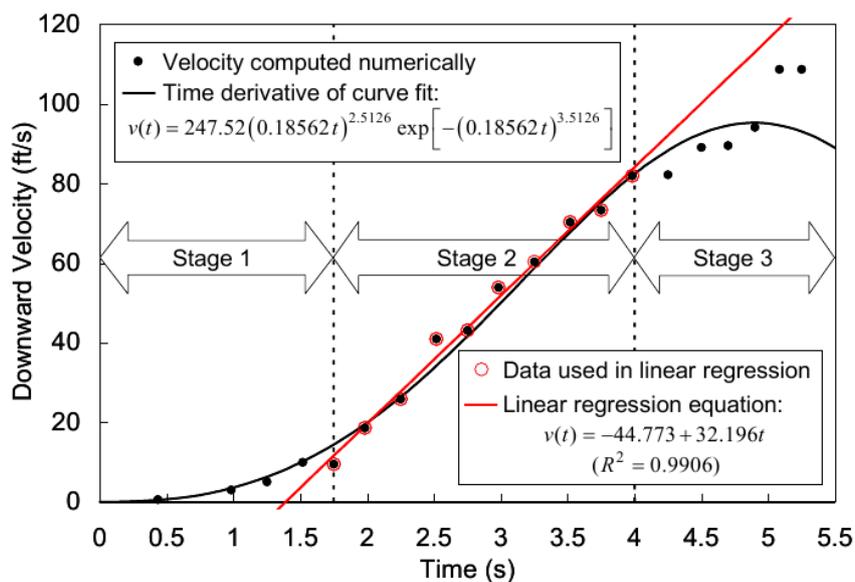


Figure 3–15. Downward velocity of north face roofline as WTC 7 began to collapse.

The graph shown above was added at the last minute into the NIST final report. The red line through the data has a slope of 32.196 ft/sec² (i.e. 9.81 m/s²). Thus NIST's own measurements in its final report concur that freefall occurred. They simply avoid reporting to the public the true implications of what this result identifies.

"[F]or NIST to admit that the building entered freefall, even for two seconds, would be for it to admit, implicitly, that the building had been intentionally demolished through the use of explosives of some sort."-(Professor Griffin, 2010).

For a large building (100 metres side to side) to collapse with a level roof line at free fall, the building's entire structural integrity must have been removed simultaneously and instantaneously.

This is simple Physics: A brick dropped in water cannot fall as fast as a brick in the air because water provides much more resistance to its motion. Any resistance of any kind will slow the rate of fall. The 40 thousand tons of structural steel, which supported WTC7, must have had its strength and integrity reduced to zero almost instantly in order for the building to fall at freefall.

Even a small amount of resistance would have been measurable as reduced downward acceleration. Any lack of symmetry in the resistance would have caused the building to tumble instead of coming straight down through its own structure. In the case of Building 7, the measured acceleration is exactly equal to the acceleration of gravity to within the margin of error of the measurements.

David Chandler explained the significance of the freefall:

“Freefall can only be achieved if there is zero resistance to the motion. In other words, the gravitational potential energy of the building is not available to crush or deform anything. During freefall, all of the gravitational potential energy of the building is being converted into kinetic energy and nothing else. Any breaking, bending, crushing, or pulverising of the building components is occurring without the assistance of the free-falling portion of the building. Any force the top portion of the building might exert on the lower portion would be reflected in a reaction force that would produce an observable slowing of the rate of fall.”

“What is particularly striking is the suddenness of onset of freefall. Acceleration doesn't build up gradually.... The building went from full support to zero support, instantly.... One moment, the building is holding; the next moment it lets go and is in complete freefall.”

What David Chandler goes on to explain is even stronger evidence of explosive demolition:

“The onset of freefall was not only sudden; it extended across the whole width of the building.... The fact that the roof stayed level shows the building was in freefall across the entire width. The collapse we see cannot be due to a column failure, or a few column failures. All 24 interior columns and 58 perimeter columns had to have been removed.... simultaneously, within a small fraction of a second.”

Korol, Heerema and Sivakumaran (2016), of the Department of Civil Engineering at McMaster University, in their study, *‘The collapse of WTC7: A re-examination of the “simple analysis” approach’*, address the very heart of the issue of whether there was sufficient resistance built into the structure of Building 7 that regardless of a local failure, the structure should not have suffered a total collapse. In doing so they allow for the two key storeys to theoretically sustain extremely hot fires, to such an extent that 66% of their columns totally lost axial resistance capability. Their analysis concluded that “Newton’s laws of motion and energy conservation considerations would have had to have been violated to explain that building’s total collapse within a debris pile several storeys high.”

There is another simple question worth asking regarding the collapse. If a fire caused a progressive chain reactive collapse, with one column buckling, causing concrete reinforced floors to collapse, then causing all the other columns to fail, where did all the 610 feet tall columns go? They are not visible in the 40-50 feet high pile of rubble, which stayed within the footprint of the building. There are no several-hundred-foot-long columns falling on other buildings and into the streets.

The following section is written specifically for this report by David Chandler, the retired Physics teacher who demonstrated to NIST that freefall of WTC7 did actually occur.

Measurement of the rate of descent of WTC 7 by David Chandler

My educational background is a B.S. in physics and an M.S. in Applied Mathematics. I am currently retired from about 35 years teaching physics and mathematics at the secondary and college levels.

When NIST released the final draft for public comment of their WTC 7 report in August 2008, (Entitled, "NIST NCSTAR 1A, Federal Building and Fire Safety Investigation of the World Trade Center Disaster, Final Report on the Collapse of World Trade Center Building 7, Draft for Public Comment") they quoted the height of two identifiable points in the building: the top of the parapet wall, 925 ft 4 in, and the top of the windows on the 29th floor, 683 ft 6 in, measured from some baseline below ground level. (This height information was removed from their final report.) Identifying these two points and using the difference of their heights enabled me to recalibrate my measurement. The resulting acceleration was within 1% of the acceleration of gravity, with sudden onset, for a period of about 2.5 sec. (My measurement tracked the motion of the NW corner of the building.)

The acceleration is indicated by the slope of a graph of velocity vs time. The graph turns a sharp corner, with an immediate transition from stationary (full support) to freefall (no support). After about 2.5 seconds the falling section of the building begins to interact with the underlying portion of the building and the rate of acceleration slows and then decelerates. The distance traveled in 2.5 seconds of freefall, from rest, is 30.6 m (~100 ft). This would imply zero resistance for ~8 stories.

The NIST draft report cited above claimed that the building fell to the level of the 29th floor in 5.4 sec, which they characterize as 40% longer than "freefall time." Their measurement is based on only two data points: a starting time, which they claim was the beginning of downward motion, and the disappearance of the roofline (from their Camera 3 viewpoint) at the level of the 29th floor. The equation they give for their calculation is $t = \sqrt{2h}$. It should be noted that this formula is valid only on the assumption that the acceleration is uniform over the time interval being measured. However, the acceleration is far from uniform over their 5.4 sec interval. After their starting time, the building remains full height for about 1.5 seconds then drops precipitously.

The methodology NIST uses to compare the motion of the building with the acceleration of gravity is not valid. There is no such thing as "freefall time." What they need is to find the acceleration of the building. Acceleration is the derivative of velocity, so the correct approach is to find velocity as a function of time and measure the slope of the curve. If it is a straight line graph, the acceleration is uniform. If it curves, one can describe how the acceleration varies with time. Using only a starting and ending time is like finding the slope of a straight line joining the first and last points in such a graph ignoring all the data in between. Such a measurement is either incompetent or fraudulent. (I do not believe the scientists and engineers at NIST are incompetent.)

In NIST's final report the entire analysis described in the draft report is maintained, but a few paragraphs are added with what they describe as "A more detailed examination of the same video...." They develop a graph of velocity vs time and differentiate to find the acceleration. So far, so good. However, the graph they produce is simultaneously revealing and misleading. What they call "Stage 2" is essentially linear, indicating constant acceleration. They even put a red regression line through the Stage 2 data and measure its slope as 32.196 ft/s² (= 9.81 m/s², i.e. "g"). The duration of Stage 2 is 2.25 sec. This graph is an admission that a significant period of absolute freefall actually occurred, which contradicts their earlier claims.

One of the most misleading characteristics of NIST's graph is Stage 1, which is essentially fictitious. The camera angle they are using is what they label Camera 3, looking up at WTC 7 from West St near the corner of Harrison St. They are tracking a point near the center of the building. From this viewing angle, a "kink" can be seen to develop before the collapse, and it is motion associated with this kink that establishes their claim of first downward motion, in their earlier measurement, and the beginning of Stage 1 in their "more detailed examination." However, the kink is not visible on video footage shot level with the top of the building. Therefore, it is not downward motion at all. It is a lateral fold in the north face of the building. Whether the distortion is a lateral fold or a vertical kink is ambiguous

from their upward-looking camera angle. It is the lateral motion of points near the center of the building that are misconstrued as vertical motion to produce the appearance of a gradual transition into freefall in their graph. They use an upward looking viewpoint to misinterpret the nature of the motion of the building and compound the problem by choosing a tracking point near the center of the roofline, which maximizes the ambiguity. My own measurement uses the corner of the building which does not participate in the folding motion and a camera angle level with the top of the building. The corresponding graph, which shows a sudden transition from motionlessness to freefall, is a much more accurate description of events.

The curve they fit to the data (which may intimidate non-mathematical readers) is merely an interpolation curve. It is the mathematical equivalent of laying a wet noodle on the page and nudging it around until it produces a smooth curve through the data. It has no physical significance and fails to even fit their data in Stage 3. Its only purpose seems to be to emphasize the erroneous claim of a smooth transition from Stage 1 to Stage 2. (Even if there were a smooth transition, freefall would still be anomalous, implying zero structural support.)

The conclusion of this section in the NIST final report states:

“As noted above, the collapse time was approximately 40 percent longer than that of free fall for the first 18 stories of descent. The detailed analysis shows that this increase in time is due primarily to Stage 1. The three stages of collapse progression described above are consistent with the results of the global collapse analyses discussed in Chapter 12 of NIST NCSTAR 1-9.”

Thus they reaffirm the original, irrelevant and arguably fraudulent initial analysis, they state that the differences between the two approaches are primarily due to Stage 1, which is based on erroneous data, and they completely ignore the significance of the admitted freefall in Stage 2. Chapter 12 of NIST NCSTAR 1-9 was not changed since the draft report. The draft report denies freefall, and nothing in the larger document even attempts to address the significance of freefall.

Evidence of explosions and explosives

For a controlled demolition to have occurred there should be evidence and indications of explosions and explosives. NIST claimed to have “found no evidence of a ... controlled demolition event.” (NIST NCSTAR 1-9: 324)

If the NIST investigation had followed the USA’s *Guide for Fire and Explosion Investigations* put out by the National Fire Protection Association (NFPA) it would have been forced to begin its investigation by looking for evidence of the involvement of explosives. This manual states that investigations should look for evidence of explosives whenever there is “high-order damage,” which it defines as:

High-order damage is characterized by shattering of the structure, producing small, pulverized debris. Walls, roofs, and structural members are splintered or shattered, with the building completely demolished. Debris is thrown great distances, possibly hundreds of feet.

The first two sentences in this description apply fully to the destruction of WTC7.

According to Professor D.R. Griffin, [The] most likely hypothesis for WTC7’s collapse, based on observations and evidence, would have been that it was brought down by explosives in the procedure known as controlled demolition. The two most obvious reasons to consider this most likely hypothesis: First, all previous collapses of steel-framed high-rise buildings had been produced by controlled demolition. Prior to 9/11, no building of this type had ever collapsed without the aid of pre-placed explosives. Second, the collapse of WTC7 exemplified many of the signature features of the type of controlled demolition known as implosion.

This second point was ignored by Shyam Sunder, NIST's lead investigator, when at the press conference to unveil NIST's report on WTC7 he said:

[W]e knew from the beginning of our study that understanding what happened to Building 7 on 9/11 would be difficult. It did not fit any textbook description that you could readily point to and say, yes, that's why the building failed.

Based upon the aforementioned seven key textbook descriptive features of controlled demolition, "Sunder's statement was false." (Professor Griffin, 2010)

The fact that the building's collapse exemplified all seven of these key features of a classic controlled demolition, showed signs in accordance with the NFPA's definition of 'high-order damage' and was part of an alleged terrorist attack, its investigation should have started looking at the use of explosives from the very beginning. Yet NIST adopted the hypothesis of unprecedented collapse due to fire as a cause.



Normal gravitational building collapse retaining large sections of concrete

Normally, when a building collapses without explosives, a lot of the building, like floors and other reinforced concrete sections, remains intact creating voids where casualties can survive. Specialist Fire and Rescue teams are known as USAR and are trained to locate and extricate casualties in these situations. As previously mentioned, this was not the case with WTC7.

The World Trade Centre Chief Structural Engineer, Leslie Robertson, describes the debris pile of WTC 7 as "a big sand pile... twisted steel, and sand and gravel." ([ref](#)). This is very uncharacteristic for a normal gravitational building collapse.

Witness reports of the sounds of explosions

At the time of the collapse, a significant number of witnesses in the area reported the sounds of repeated explosions, including members of the public, Police Officers, Firefighters and First Responders. These explosions can be heard in AV footage of the day's events. Yet these reports were not investigated by NIST. This linked video, "[WTC 7: Sound Evidence for Explosions](#)", is a good example of some of the evidence of explosions coming from Building 7.

The following is from Firefighters who witnessed explosions before and during the collapse of WTC 7.

"It's blowin' boy"... "Did you hear that?"... "Move it back, that building is about to blow up."... "The whole thing is about to blow up, move it back."... "Keep your eye on that building, it will be coming down soon"... "We are walking back 'cause that building is about to blow up"... 'coming down soon'... "we got to move back, seven is exploding!"... "it's gone man." ([Ref](#))

Former NYPD officer Craig Bartmer reported:

"I was real close to Building 7 when it fell down.... That didn't sound like just a building falling down to me.... There's a lot of eyewitness testimony down there of hearing explosions.... [A]ll of a sudden.... I looked up, and... the thing started peeling in on itself.... I started running... and the whole time you're hearing "boom, boom, boom, boom, boom."

As previously discussed, a witness by the name of Barry Jennings, Deputy Director of the Emergency Services Department of NYC Housing Authority, was trapped inside the building for over 3 hours with another colleague during these fires. He was unaware of the evacuation orders and had made his way up to the Office of Emergency Management on the 23rd floor after the evacuation.

Upon his arrival in the office early in the morning, he phoned his superior and was told, "Get out of there! Get out of there quick!", his superior appeared to know that something more serious was about to occur. He tried to escape but some of the concrete stairs had been destroyed. At one point, while on the 6th floor, he heard a very loud explosion underneath him and was thrown off his feet and across the floor. Barry Jennings is absolutely certain that this occurred prior to the towers collapsing. He also reported several other separate explosions occurring afterwards while he was trapped in the building.

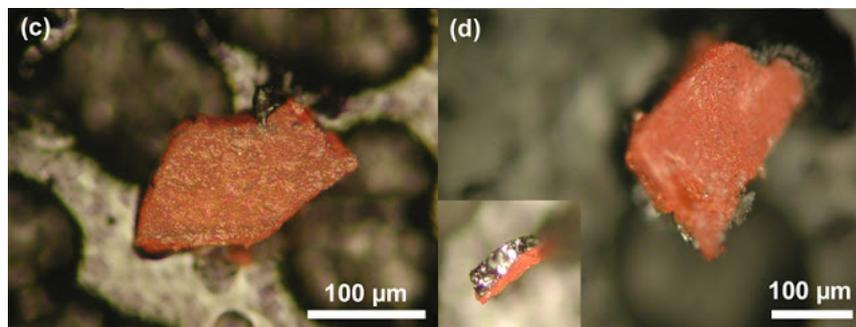
He was later rescued from the building by Firefighters, sometime around noon. When he reached the street he was strangely told, by a Police Officer, "You have to run," to which Jennings replied, "I can't run, my knees are swollen." The cop then said, "You'll have to get on your knees and crawl, then, because we have reports of more explosions." Mr. Jennings can be heard being interviewed [here](#). These are a sample of many more similar witness reports.

Evidence of unreacted explosive residue

Adding to the evidence of the involvement of explosives in the collapse of the towers is the discovery, by a team of scientists, of unignited explosive residues; an active thermitic material, within the dust collected from the WTC debris. The team analysed dust samples that were collected from four locations near Ground Zero. One sample was collected ten minutes after the North Tower exploded so it could not have been contaminated with particles from the clean-up efforts. Upon analysis, all four samples contained the same unusual, tiny red/grey chips, which turned out to be the ingredients of thermitic.

Several features of the thermitic material found at the World Trade Centre suggested to this team of scientists that it was nano thermitic, rather than ordinary (macro) thermitic. Nanothermitic is described as an advanced military grade explosive. The molecular science behind this substance is very impressive but beyond the scope of this report. Readers are recommended to refer to the cited and rigorously peer reviewed paper for a deeper understanding of this substance's significance.

Thermitic is a pyrotechnic material which, when ignited, undergoes a very rapid exothermic reaction creating bursts of extremely high heat. Nanothermitic is many times more powerful than normal thermitic.



Photomicrographs of active thermitic material found in samples of the WTC dust

These findings were peer reviewed and published in The Open Chemical Physics Journal, 2009, in an article entitled "[Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe.](#)"

Explosives are consistently used in the history of terrorist attacks; therefore, NIST should have investigated their involvement. The official report did not include any investigation for accelerants, explosives or explosive residues.

NIST claims they did not test for explosives because they "found no evidence supporting the existence of a blast event." This directly contradicts the physical damage at the scene, firefighter and emergency service professional testimony of explosions, audio and video recordings of explosions, and prior history of explosives being used at the WTC complex in 1993. It also contradicts the NFPA 921 definition which states that 'blast sounds' are not an essential element in an explosion.

Certain foreknowledge of Building 7's collapse

Building 7's collapse, according to NIST, "was the result of a series of accidental and unpredictable factors", which did not come together in such a way as to determine the fate of the building until minutes, or possibly even seconds, before the collapse took place. Based upon these facts and the lack of previous empirical evidence, this collapse could not have been realistically predicted.

Therefore, serious questions need to be asked about the certainty of foreknowledge of Building 7's collapse by the media and city officials on the day. The BBC reported its collapse 20 minutes before it actually happened. The American television channel CNN was reporting its collapse hours before, with a running commentary of its progress hour by hour. Notice in the adjacent picture the sub-captions in conflict with the reality behind.



"There are two types of foreknowledge: evidence-based and action based foreknowledge. Evidence-based is when you see something and you study it, measure it, whatever, and you find evidence that leads you to rationally conclude that something is going to happen. You gain your foreknowledge through your study of the evidence. Action based foreknowledge is when you know something is going to happen because you darn well are going to make it happen." - Dr. Graeme MacQueen ([University of Hartford Presentation](#))

The foreknowledge at the scene of Building 7 on September 11, 2001, has been investigated thoroughly by retired Canadian University Professor Graeme MacQueen. ([Ref](#)) This investigation involved the textual evidence of the oral histories of the FDNY - about 10,000 pages of primary source, extremely valuable documents to establish how much awareness there was among the Firefighters at WTC7. He identified 60 Firefighters who had an awareness that it was going to come down. He found a surprising degree of certainty, just over half of them expressed certainty, that they had been informed building 7 was definitely coming down. Some were informed 30 minutes before it fell that it was coming down. Some were informed an hour before its fall that it was coming down. Some were informed 2 hours before it fell that it was coming down. Some were even informed 4 hours before it fell that it was definitely coming down. This foreknowledge is extraordinary. These Firefighters were most likely basing their knowledge upon information cascaded from above. Given the magnitude of the day's incidents, including the very unusual collapse of the twin towers that morning, they themselves were unlikely to be making this assessment but simply believed what they were being told by someone with seniority. As Dr. MacQueen reveals, there is indeed evidence among the Firefighters that foreknowledge of the collapse was certain.

In the BBC Conspiracy Files episode on WTC 7, FDNY Chief Peter Hayden made this statement:

"We were concerned of the possibility of collapse of the building. And we had a discussion with one particular engineer there, and we asked him, if we allowed it to burn could we anticipate a collapse, and if so, how soon? And it turned out that he was pretty much right on the money, that he said, 'In its current state, you have about five hours.'"

Peter Hayden is quoted making reference to this engineer in a 2013 court document:

"Chief of Department Peter Hayden consulted with an engineer:

We posed to him the question that considering the structural damage that was obvious to the – to the building on the southwest corner and the amount of fire damage that was occurring within the building, could we anticipate a

collapse and if so, when. He said yes and he gave an approximate time of five to six hours, which was pretty much right on the money because the building collapsed about 5 o'clock that afternoon."

This engineer managed to very accurately predict the time of WTC7's collapse. However, nobody actually knows who this "engineer" was. His name is lost to history, but Shayam Sunder the lead investigator at NIST has acknowledged his existence on a couple of occasions in interviews.

This quote by another firefighter gives a clue to where this engineer may have come from:

"Someone from the Office of Emergency Management told us that this building was in serious danger of collapse. The consensus was that it was basically a lost cause and we should not lose anyone else trying to save it. Rich, a few other people and I went inside to the stairwells and started yelling up "Drop everything and get out!" It didn't collapse until much later in the afternoon, but we felt it was better to get everybody out." (September 11: An Oral History by Dean Murphy)

So, there is evidence that the top fire chiefs were told that it was going to collapse. The three quotes above are examples of foreknowledge and the identity of whoever was leading the fire chief's decisions on that day.

When the BBC was questioned by independent investigators about its foreknowledge of the collapse it claimed this was just an error and that it "was not part of a conspiracy." To this day it has not revealed the primary source of that information.

The FBI, the 9/11 Commission and NIST all failed to ask questions of how the BBC, CNN, or other officials possessed this foreknowledge.

Unfortunately, the BBC's involvement does not end there. In 2007 when they aired the documentary "9/11 - The Third Tower", they tried to prove that free fall did not occur during the fall of WTC7, indicating their understanding that free fall is evidence of controlled demolition. One year later, when NIST's investigators were finally forced to admit that free fall did actually occur in WTC7, this should have been headline news reported by the BBC and all newspapers around the world as a breakthrough in the 9/11 investigations, proving controlled demolition. The BBC edited the section regarding free fall out of post-2008 screenings of this documentary, something which researchers can prove and are in the process of challenging.

With an honest and well-researched understanding of the original version of events and interviews of Jennings and Hess, the two men trapped in WTC7, it is possible to detect a deliberate editorial bias and misrepresentation on the part of this documentary's producers. This is covered in detail in Professor Griffin's book, *The Mysterious Collapse of World Trade Center 7*, (p.95-104).

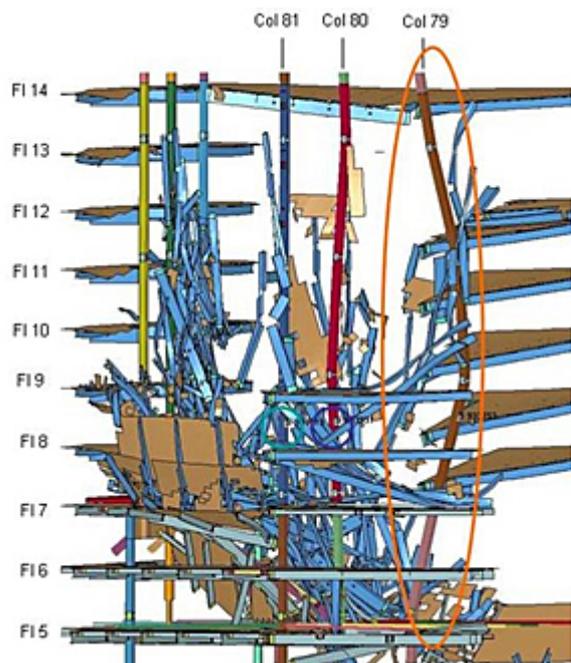
The BBC is legally and morally required to correct the error they made in their own documentary. According to section 3 of the BBC's Editorial Guidelines, titled Accuracy Principles, "The BBC must not knowingly and materially mislead its audiences. We should not distort known facts, present invented material as fact or otherwise undermine our audience's' trust in our content." and "We should normally acknowledge serious factual errors and correct them quickly, clearly and appropriately." However, to this day the BBC has refused to correct that error on an issue of absolutely massive importance.

The above details about the BBC and CNN's coverage and reporting are included merely as evidence of possible foreknowledge, which points towards an alternative cause of building collapse and therefore contributes to the refutation of the risk to operational Firefighters, as detailed in NIST's hypothesis.

A critical analysis of the NIST hypothesis of collapse

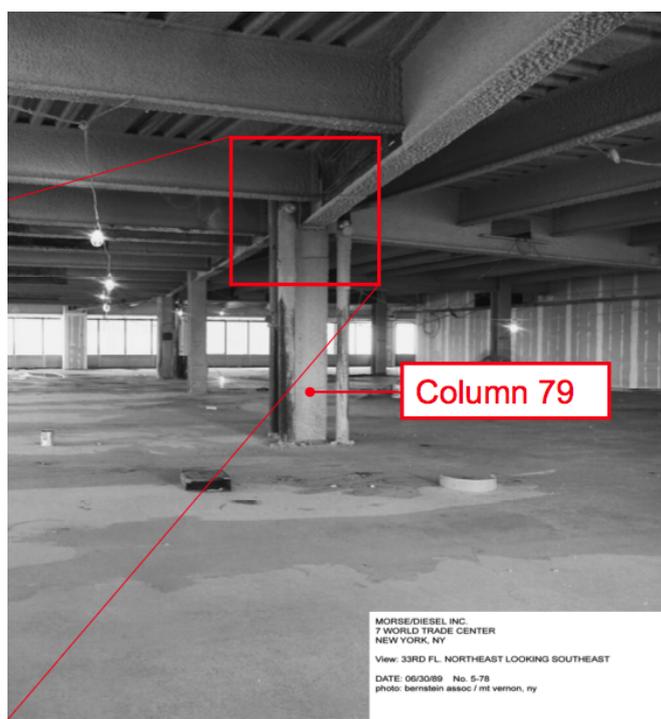
At this incident, in contravention of everything Firefighters are taught about crime scene protection and preservation, almost all of the evidence was destroyed. There was only an extremely limited and superficial examination of the scene due to the immediate clearance of the site. Unfortunately, the US Government broke numerous federal laws in its removal of this evidence and forensic data, which could have better identified the cause of this incident ([More info](#)).

Erik Lawyer, a Firefighter with the Seattle Fire Department with over 25 years of emergency services experience, was at Ground Zero in the weeks following September 11th and saw some of the debris removal process first hand. He explains that initially, he was not concerned about the rapid removal of the World Trade Centre building remains as he was busy with the ongoing search, rescue and recovery operations. But later, after leaving New York, what he had seen started to trouble him.



He started looking more closely at the fire investigation and learned that the evidence that was being removed from WTC 7 was also being destroyed before any investigation into the cause of collapse took place. In his opinion, a failure to examine physical evidence in the first confirmed complete collapse of a concrete and steel-frame high-rise building due to normal office fires is a dangerous precedent to set.

The removal of the debris was in clear contravention of federal laws and the most basic national standards set by the National Fire Protection Association, particularly – ‘NFPA 921-Spoilation of Evidence’ and ‘NFPA 921-Preservation of the Fire Scene and Physical Evidence’.



Even though with more than 100 previous examples of high-rise fires; most of them very hot, very large and very long-lasting; where not one collapsed, NIST was content to arrive at a unique conclusion based entirely on computer-generated predictions of probable cause. It is a theory which, as you will hear, is based upon fundamentally flawed calculations and data which are being withheld from verification.

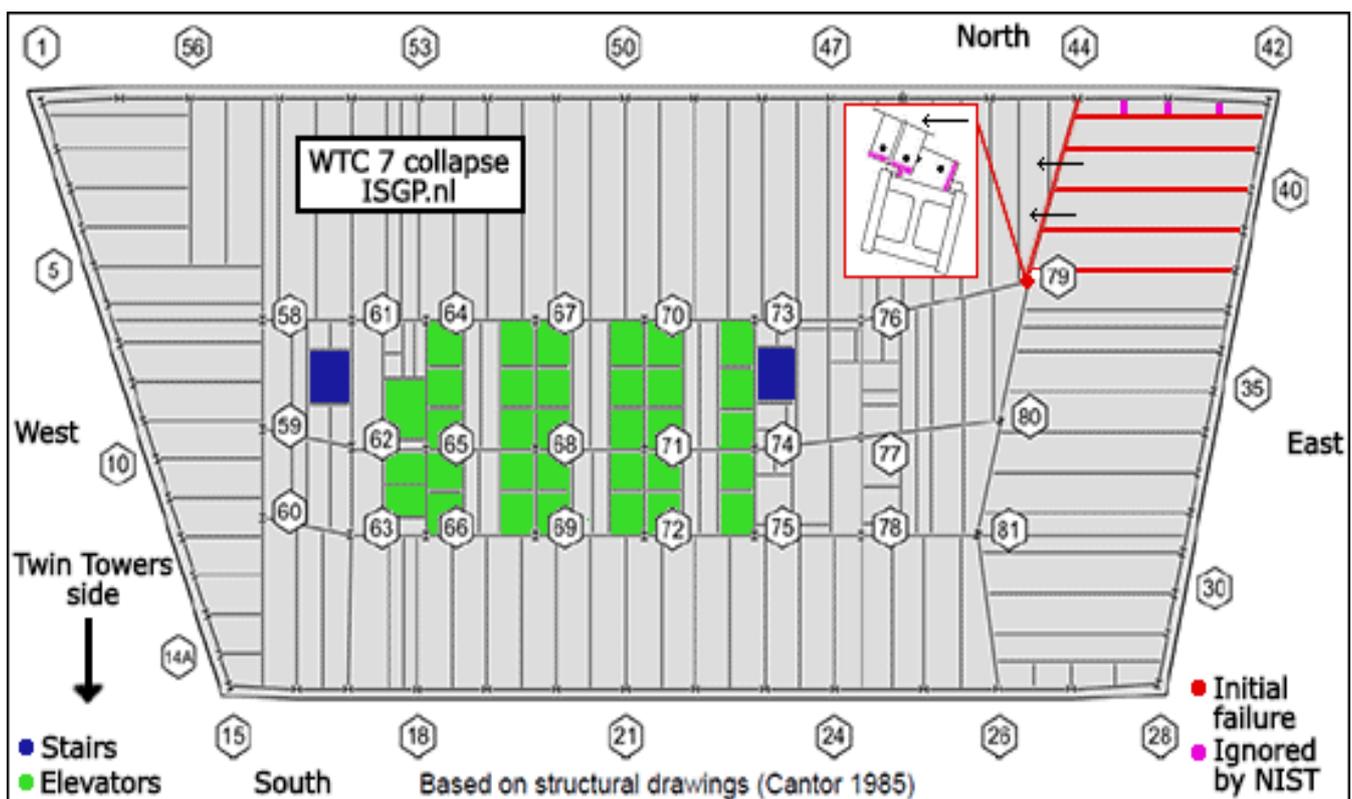
According to NIST, the root cause of the building failure was a buildup of heat from a normal office fire on the 12th floor. This is said to have caused the excessive linear thermal expansion of floor beams in the 13th floor which caused the dislocation of a girder. (In order for this to occur, the expanding composite floor beams would need to snap over one hundred high-strength bolts and other structural connections.) This failure is said to have had a knock-on effect for several floors leaving a single column unsupported, thereby causing it to buckle. Nearby columns

were then unable to absorb the transfer of load, which initiated a progressive collapse, and led to catastrophic failure of the entire building.

This raises a number of obvious questions. Firstly, did the steel structure and its fire protection in this area of the building incur damage from the falling debris? Secondly, normal office fires will usually only burn for about 30-60 minutes in any particular area before they start to run out of fuel. Was there an unusual amount of fuel to feed the fire in this part of the building which might explain any prolonged duration of fire beyond the 2-3 hours of fire protection?

The answer to both of these questions is no. There was no damage in the north-east area of the building from falling debris and there was no surplus of combustible materials reported in that area to fuel a prolonged fire.

There are a number of further problems with the computer simulation. In order for it to be accurate and dependable an incredibly thorough and detailed knowledge of the building's construction, material composition and condition would be critical to ensure the accuracy of the data being input into the software for the analysis. In NIST's disclaimer section, right at the beginning of their 2008 final report, they admit under disclaimer No.4 - "NIST could not verify the actual (or as-built) construction, the properties and condition of the materials used, or changes to the original construction made over the life of the building." If they did not have this knowledge of the building, how did they produce a valid and accurate computer analysis of the building's failure?



Unfortunately for NIST, after a successful FOIA request in 2011 for the shop fabrication and erection drawings of Building 7, their report was found to have omitted crucial data from its computer simulation model. These key omissions include correct girder seat width, girder stiffeners, and lateral support beams; all of which serve to seriously undermine, if not entirely refute, their hypothesis regarding the lateral displacement for the key girder (A2001), which is said to have fallen off its seat and initiated the entire building's collapse. (More information can be found [here](#).)

Shear studs



Shear studs, as seen in the two diagrams, are short unthreaded bolts welded to the top flange of a steel girder. The shear studs become embedded in the above concrete flooring slab to form a composite beam, which then acts structurally as one beam which is stronger than the steel beam.

In the 2008 NIST Final Report, it was said that the key girders did not have shear studs. The fact that these girders did not have shear studs was then said to play a crucial role in the chain of events leading to the building's structural failure:

*Floor beams and exterior spandrel beams had shear studs, but the girders that supported the floor beams **did not** have shear studs -(NIST NCSTAR 1-9: 462). In WTC7, no studs were installed on the girders. -(Ibid.)*

NIST explained that if the shear studs had been included, connecting the girder directly to the floor as a “composite girder” structure, the structural failure would not have occurred due to an increased lateral stiffness of the girders preventing the floor beams from expanding freely. (Ibid., 347-48)



NIST used the theoretical absence of these shear studs as a reason to explain WTC7's collapse, compared with other buildings which stayed upright in the face of more aggressive fires. They explained that those buildings' structural design and construction was different, citing the use of girder shear studs in those buildings as a reason for their greater resilience to stress from fires (NIST, NCSTAR, Draft 2008, 341 and 525). This was used repeatedly by NIST to explain this difference and was indeed a strong argument identifying a causal relationship. The following sentence is repeated twice in the draft report, “Additional factors that contributed to the girder failures were the absence of shear studs that would have provided lateral restraint.” (Ibid., 535 and 603)

However, in 2004 before NIST developed its hypothesis of girder expansion as part of the cause of the building's failure, it stated that shear studs did connect the girders to the floor slabs. This is confirmed in Professor Griffin's research (The Mysterious Collapse of WTC7, 2010, p.215), where he explains that in the 2004 interim report it was specified that the crucial girder in NIST's 2008 theory – the one connecting Columns 44 and 79 – was anchored to the floor slab with at least 22 shear studs. In a later 2005 draft report, NIST stated: “Most of the beams and girders were made composite with the slabs through the use of shear studs.” (NIST NCSTAR 1-1, 2005)

An additional problem for the NIST is the fact that these supposedly missing crucial shear studs are detailed in the original fabrication drawings. One of the project managers involved in the construction of Building 7, John Salvarinas shows in his original 1986 fabrication drawings that there were indeed 30 shear studs along girder A2001 between column 79 and 44. This is shown in diagram 11-18 as “W33x130-30s”, the “30s” represents 30 shear studs, all 5 beams implicated in the expansion are also shown as having 28 shear studs. ([Ref](#))

The shear studs in girder A2001, which according to NIST were missing and would have prevented the structural failure leading to the global collapse, were in fact in place – 30 of them.

This problem is further compounded for NIST by the findings of Korol et al (2015), in their study, 'Performance-based fire protection of office buildings: A case study on the collapse of WTC 7', which concluded that **the beams in question "could not have elongated enough to cause a crucial walk-off of its adjoining girder. This conclusion is valid, whether or not shear connections were present or not."**

Temperature simulations

NIST's model of thermal expansion required some very 'special' fires to succeed. Their proposed levels of thermal expansion required the maximum possible temperatures from an office fire, for as long as possible for the given fuel loads. This is not impossible but it would require a special set of circumstances, including the survival of long duration fires on the key lower floors.

It appeared likely the critical damage state occurred between 3.5 hr and 4 hr (NIST NCSTAR 1A: 36)

NIST claimed that fires burned for 7 hours on 6 floors, this is slightly deceptive. Multiple sources of footage show fires lasting significantly less than this. Even the video and photographic evidence provided by NIST was only consistent with fires on these floors lasting between 40 minutes and 3 hours 20 minutes at most, and not in any static location. NIST appear to be trying to make the fires sound more damaging than they actually were. They openly admit within their reports that the fires were only able to persist for between 15-30 minutes in any one location due to restricted combustible fuel loads ([Ref1](#) and [Ref2](#)). The overall duration helps to reflect the fact that the fires were small, travelling, and left to burn.

To achieve the high temperatures necessary to cause the expansion and damage hypothesised in their computer model, the following factors were needed:

- A long lasting fuel source – NIST estimated the combustible fuel load on the key floors (11 & 12) by over 50% compared with other floors at Building 7 with similar functions. Their figures are inconsistent with other floors in that building, but within an acceptable range for an office environment.
- Maximal gas temperatures for a normal office fire – NIST portrayed air temperatures exceeding 1000°C (1832°F), which is not unusual, but in reality, this would be a peak and temporary temperature. NIST exaggerated the duration of these temperatures in order to reach its thermal expansion figures, sometimes showing high temperatures at locations where photographs showed that the fire had actually burned out an hour or two earlier. The fire simulation graphics of floor 12 (page 383 of NIST NCSTAR 1-9 Vol.1, 2008) shows the fire burning around column 79 at 4:00 pm and 5:00 pm. This is not consistent with photographic evidence which reveals that at three forty in the afternoon, 1 hour 41 minutes before the collapse, the fire had burned out at this location on the 12th floor.
- Minimal heat loss in conjunction with good fresh air supply - NIST's simulated energy levels almost needed an adiabatic process, in which no heat is lost. This would not be possible. Each floor was almost the size of a soccer field and capable of distributing heat energy widely. There would also have been high levels of convective heat loss due to most of the windows on the south face of the building being broken. The north face glazing had also failed along the entire width of the fire-floors. Heat energy should have been able to escape easily leading to a 'cooler' fire.

NIST's thermal estimations also appear to have ignored the high conductive capacity and thermal dissipation qualities of the steel framework, which would reduce local thermal loading in sections of steel.

Even with higher estimated levels of combustible fuel loads (45 kg/m² vs 32 kg/m² used by NIST), Korol et al (2015), in their study, 'Performance-based fire protection of office buildings: A case study on the collapse of WTC 7', concluded that regardless of the choice of three thicknesses of structural fire protection employed, "fires alone could not have caused the commencement of the collapse of Building 7 at the location cited [by NIST]."

In a nutshell, NIST's simulated fires appear to have been 'optimised'. Their estimated thermal energy figures were probably too high for a well-ventilated area and lasted 2-3 hours longer than fires could realistically be expected to in a normal office environment. If NIST's estimations of the fire temperatures are too high, then the estimated temperatures of the steel are also likely too high. Additionally, it has been shown that even if the thermal energy levels were as high as NIST predicts in its simulations, the mechanical failures due to excessive thermal expansion could not have been possible with or without all the structural omissions from their model. ([Ref](#))

An independent structural engineer's explanation of the impossibility of NIST's hypothesis

The following section in italics is written by Tony Szamboti (BSME) especially for this report. He is a mechanical engineer from the Philadelphia area with over 26 years of experience in the aerospace industry. He designs structures for aircraft, spacecraft, and support equipment. For a professional explanation of the impossibility of NIST's claims please read his article "[Why the NIST collapse initiation mechanism for WTC7 is unsubstantiated and impossible](#)". The following is a summary:

"The NIST WTC 7 report claims that girder A2001, situated between exterior column 44 and corner core column 79 in the northeast corner of the building, had its web pushed beyond its 12" wide seat at column 79 under the 13th floor by five beams framing into the girder from the east. They say this applied the load to the girder's flange, which could not take the load in flexure, causing the girder to fall with the northeast floor section it supported then falling onto the next floor down shearing its seat at column 79 and causing an eight floor cascade leaving column 79 laterally unsupported from the north for nine stories. Column 79 had girders on three sides and the report says the connections to it of those from the south and west had been broken due to thermal expansion on floors 7 through 13 leaving the column completely unsupported for a length of nine stories causing it to buckle. The report says this caused the entire east side interior to progressively collapse and the east penthouse to fall down into the building. The report then says the progressive collapse proceeded from east to west with the entire interior going down leaving the exterior as a hollow shell with all of its columns buckling over a 2 second period starting at the southwest corner and the entire exterior coming down.

The problems with this story start with the amount of expansion required of the beams to push the girder web off its seat. The web is 0.580 inches thick and with the 12" wide seat the expansion would have to be 6.29 inches. At 600 °C the expansion of the longest beam at 53' 8-11/16" would be about 5.5", and actually around 5.4" when shortening due to sagging is considered. With shortening due to sagging overtaking expansion at 654 °C the expansion is limited to about 5.7". It is interesting that the report said the seat was only 11" wide at first, which would work with the maximum expansion, until the drawings were released three years later and it was found that the seat was actually 12" wide. NIST was questioned on this and forced to admit the seat was actually 12" wide and wrote an erratum. However, the erratum simply said the lateral travel of the girder would have been 6.25" without explaining where they got the extra 3/4" of expansion. See the Technical Discussion on pages 4 through 14 at the following link: <http://www.journalof911studies.com/resources/2014JanLetterPepper.pdf>

In addition, all of the expansion is considered to go to the west and the 3/4" gap between the beams and the east side exterior column web is ignored. Of course, there were four 7/8" diameter bolts at that end of the beam holding it to its seat and top clip, but it is not credible to expect the bolts not to shear at that end of the beams while the 28 shear studs on the beams and the 7/8" bolts on the girder were claimed to have broken due to thermal expansion. See figure 4 at the above link.

An additional discrepancy found during a review of the drawings was that the girder had partial height web stiffeners at its column 79 end which was not included in the NIST analysis. These stiffeners were ¾" thick and 18" high and went from the web to the edge of the flanges. See figure 5 in the link provided. These stiffeners would have provided support to the flange and significantly increased the section modulus preventing the flange failure even if the web could have been pushed beyond the edge of the seat. NIST did not admit to this omission of a pertinent structural feature at first but finally did after 19 months of being questioned about it saying they were for web crippling and their analysis said there was no web crippling.

The NIST report also ignores the side plates on column 79 interfering with the girder's lateral travel. These plates protruded 1.8" from the flange of column 79 and would have been contacted by the expanded girder, which had broken its seat bolts, after just 3" of lateral travel. The ARUP analysis shows the girder could not have been pushed past the column side plate. ([Ref4](#))

The girder being trapped by the column side plate also makes a moot point out of any suggestion that column 79 could have been pushed to the east by the west side girder to generate additional lateral travel of the girder relative to the seat.

The NIST report simply claims that when the girder fell the northeast corner floor area it was supporting then fell down onto the next floor down and sheared the girder's seat at column 79. The force required to shear this 14" x 2" x 18" plate welded to column 79 is 632,000 lbs. The participating parts of the falling beam and girder assembly and floor slab weigh about 46,000 lbs. and NIST provides no analysis showing there would be enough amplification of the load in an impact to shear the seat. Analysis by other engineers shows the force of impact to be no more than 200,000 lbs. so even if a girder did fall it could not break through the next floor down

The ARUP analysis also shows the connections of the girders framing into column 79 from the south and west side would have remained stable and not broken. See figure 132 of the above link again. Thus column 79 would not have gone without lateral support for more than one floor, even if the 13th-floor girder did fall off its seat, which can be seen above to be nearly impossible to have happened.

The report says the east penthouse collapse was due to column 79 buckling starting from the 13th-floor girder failure causing a full east side interior collapse. However, video evidence shows:-

- 1. The shock wave from the penthouse collapse goes top to bottom.*
- 2. Daylight is only seen at the top story windows even though the building was 144 feet wide.*
- 3. Windows are only broken 15 stories down from the roof.*
- 4. There is no dust observed emanating from windows on the east side until the exterior comes down.*
- 5. There is no deformation of the east side exterior columns.*

These observations seem to show that the east penthouse collapse only involved failures at the top of the building and that the east side interior was intact throughout most of the height of the building.

The videos show all four corners of the roofline moving downward simultaneously even with the horizon at about 1 meter per second for about half a second and then the entire building goes into free fall acceleration for eight stories.

The simplest explanation for these observations is that the collapse was actually due to a controlled demolition performed by removing eight stories of the central core (24 columns total) almost simultaneously with the first to fall being in the center. This would pull the exterior columns inward on all four faces of the building causing them to be extremely slender with no lateral support for about nine stories and high eccentricity with an inward pull causing them to buckle with little to no resistance. The reason for the slower start is there was some initial resistance while

the columns were being pulled inward until what is known as snap through was reached where the eccentricity and slenderness caused it to quickly fail in a sudden way with no resistance. [See this linked pdf about bifurcation buckling](#) and you will see this snap-through phenomena discussed, and that it occurs with a transverse load, which the falling core would have been applying to the exterior.”-Tony Szamboti (BSME)

If the above is difficult to visualize, the following link takes you to an excellently detailed webinar which objectively describes the problems with NIST’s theory of collapse “[An Objective Look at the Collapse of WTC 7](#)”.

Structural Engineer Kamal Obeid, concurs with Szamboti, stating that even if a connection failure, such as that being proposed by NIST, had occurred, the likelihood of that failure dragging the entire building down in such a fashion that all the columns would fail at the same time would be an impossibility.

This is essentially the same conclusion drawn by Physicist Professor Steven Jones - “The likelihood of near-symmetrical collapse of WTC7 due to random fires (the “official” theory) – requiring as it does near-simultaneous failure of many support columns – is infinitesimal.”

When watching the final NIST computer animated model of collapse, it is obvious that it did not match the observed event and ended very prematurely in the collapse sequence. To a normal member of the public, these graphical representations may look impressive and give the study the appearance of sophistication, complexity, and accuracy. But without the data being verified and peer reviewed, it could be argued that the computer simulations we are shown by NIST are no more than colorful animations.

Despite many requests from national bodies, such as The American Institute of Architects and academic institutions, the data used in the computer simulation has never been released for peer review. NIST stated that doing so "may jeopardise public safety" which, in my view, is a curious contradiction. Complete and accurate data of this nature, if it actually exists, could only help increase public safety via its educational potential.

A true and honest scientist will always welcome challenges to test his hypothesis. If a theory can be validly refuted it should be accepted in the spirit of scientific endeavor. If the challenge fails, it simply serves to strengthen the original theory. NIST however, repeatedly ignores and dismisses any bona fide expert challenges to its reports. It’s non-compliance is shown in [this linked letter](#) by an attorney to the U.S. Department of Commerce Inspector General, concerning the NIST WTC 7 report omissions found after the drawings were released due to Freedom of Information Act requests.

The American Union of Concerned Scientists campaigns against NIST

One of the most important aspects of research is the credibility of the sources of the information used. An investigation and research paper has to have been vetted by the scholarly community to be regarded as reliable, ideally where the material has been published in reputable peer-reviewed sources or by well-regarded academic presses. The NIST reports have not been peer-reviewed.

NIST was advised by a member of the advisory committee for its WTC project, Dr. James Quintiere, to have its report submitted to the scientific community to be reviewed before publication. As a Professor of Fire Protection Engineering at the University of Maryland, and a former employee of NIST for 19 years, the final years of which he served as Chief of the Fire Science Division, Dr. Quintiere was someone NIST should have listened to. He has on a number of occasions expressed his opinion that the study needed to be peer reviewed to assess the “completeness and accuracy of their results”. He clearly had serious concerns. When he himself tried to question NIST’s reports he states that his questions were ignored and he “never received one formal reply.”

Regarding NIST's credibility, Professor David Ray Griffin explains: -

"If NIST did engage in fraudulent science, this would not be particularly surprising. NIST is an agency of the US Department of Commerce. During the years it was writing its World Trade Centre reports, therefore, it was an agency of the Bush-Cheney administration. In 2004, the Union of Concerned Scientists put out a document charging this administration with "distortion of scientific knowledge for partisan political ends." By the end of the Bush administration, this document had been signed by over 15,000 scientists, including 52 Nobel Laureates and 63 recipients of the National Medal of Science.

Moreover, a scientist who formerly worked for NIST has reported that it has been "fully hijacked from the scientific into the political realm," with the result that scientists working for NIST "lost [their] scientific independence, and became little more than 'hired guns.'" Referring in particular to NIST's work on the World Trade Centre, he said everything had to be approved by the Department of Commerce, the National Security Agency, and the Office of Management and Budget— "an arm of the Executive Office of the President," which "had a policy person specifically delegated to provide oversight on [NIST's] work."

To summarise this section: NIST distorted, omitted or ignored the following important factors: -

- 1. The calculated heat energy levels are maximised by over-estimating combustible fuel loads on key floors, combined with over-estimated fire durations for these fuel loads.**
- 2. Realistic heat energy losses via various mechanisms have been ignored, such as convection and thermal dissipation into the steel matrix of the building.**
- 3. Essential mechanical and structural omissions have been made, including correct girder seat width, girder web stiffeners, lateral support beams, thirty crucial shear studs on key girder A2001, girder side plates at column 79 which preclude girder lateral displacement, and significant thermal expansion capacity of the floor beams to the east.**
- 4. NIST's theoretical failure of several essential girder connections on multiple floors onto column 79 from the west and south, necessary for column failure, have been found to be false by research carried out independently by OVE ARUP.**
- 5. Finally, even if all of the aforementioned factors were removed from consideration and the combined beam and girder assembly had fallen onto the floor below, it would not have been nearly forceful enough to break through the next floor and cause multiple floor failures below, as proposed by NIST.**

Conclusion

Since these events 15 years ago, Firefighters' operational procedures have not been changed for fighting high-rise fires. In the UK, local government 'Stay put' policies, which advise residents in high-rise buildings and flats to remain in their property when there is a fire, have not been modified. The building design regulations have not changed and equivalent buildings have not been retrofitted with modifications to prevent a recurrence of Building 7's collapse.

However, if NIST's official report of what happened to Building 7 is maintained by our authorities as a valid explanation of events, in accordance with the Health and Safety at Work Act and other related legislation, all of the above factors need to be questioned and critically reassessed as a matter of great importance by fire services, local housing authorities, and building standards regulators.

Generally, as a rule, we tend to rely upon science rather than unfounded belief to understand our world. Science is defined as the search for truth. When a scientific truth is found, fundamentally this is always based upon a preponderance of positive probabilities. We hold these findings as true until we find a good reason to believe otherwise. A true and honest scientist will always accept questioning of his hypothesis and continue to test its validity. From my observations of NIST's analysis of this collapse, observations shared by many highly qualified professionals in their respective fields, an honest scientific approach has not been pursued.

The deliberate and immediate removal and destruction of nearly all the evidence at the scene of the crime, the failure to even mention the collapse of Building 7 in the 9/11 Commission Report, combined with the catalogue of errors and omissions in the NIST report, all aggregate to destroy any credibility this report might hope to convey.

The claims made by NIST that the sprinkler operation and fire-fighting efforts failed, due to poor water supplies and limited resources, were false and only serve to further diminish their credibility. This building's fires could have been contained and extinguished well in advance of the alleged structural failures.

The experts' evidence of the building's uninhibited gravitational free fall acceleration, its symmetrical collapse perfectly into its own footprint, witness testimonials of explosions, evidence of explosive residues, and 'certain foreknowledge' of the building's collapse, all points compellingly towards an alternative hypothesis - a deliberate case of controlled demolition. A hypothesis which, if the scientific principle of Occam's razor had been applied, should have been the first to have been tested.

This analysis has been completed without being influenced or prejudiced by the details of the politics in the background of this incident. The data and the evidence alone dictated what the study discovered. Unfortunately, it's an unavoidable fact that this case is connected with politics and, speaking personally, I can say with open sincerity that I trust Newtonian Physics and the laws of nature infinitely more than I trust politics. As previously stated, gravity is not just a good idea, it's a law. In agreement with thousands of expert architects, engineers, and scientists, the findings of this analysis identify that the risks to Firefighters at this incident were not due to faulty architecture, sub-standard engineering, untested fire-fighting procedures or a miraculous fire-induced building demolition.

The sudden and complete collapse of a steel-framed high-rise building due to normal fires presents as little risk to operational Firefighters today as it did in the days before this event.

References and Sources

In an attempt to expose this evidence and demand an independent re-investigation thousands of Architects and Structural Engineers across America are campaigning to reveal the truth of the above and more. You can find their excellent website at www.ae911truth.org

Online Summary and films:- <http://thescienceofhealthyscepticism.blogspot.co.uk/2016/05/911-tower-7-firefighters-analysis.html>

A short introductory film - https://youtu.be/toQGVBv_9Qc

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This report is written independently, and exclusively represents the investigative findings of the researcher. Other parties are encouraged to do their own research and draw their own conclusions. [Under Article 10](#) of the ECHR, an individual is legally encouraged and protected in expressing matters of public interest and safety.